



LUMS

Research at LUMS

2016 - 17

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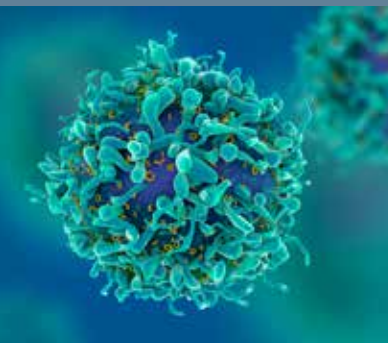
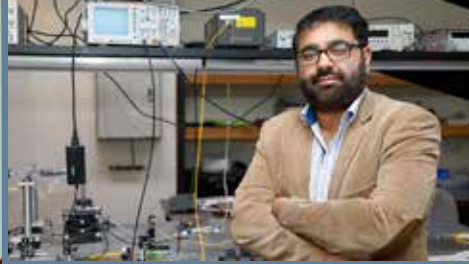
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RESEARCH AT LUMS - AN OVERVIEW

BY THE DIRECTOR, OFFICE OF SPONSORED PROGRAMMES AND RESEARCH (OSPR)



Dr. Shafay Shamail

Research at Lahore University of Management Sciences (LUMS) aims to advance the frontiers of human knowledge and improve societal well-being. Research efforts at LUMS are enhanced through creative collaborations with leading research institutions and consortia around the world. The mission of LUMS is to unite people, resources and opportunities for the creation, preservation and transmission of knowledge and generating new knowledge for the benefit of present and future generations.

LUMS has contributed to society through education, learning and research at the highest levels of international excellence. Our world-leading research underpins a huge range of innovations which create prosperity, protect the environment and enrich the culture. Faculty at LUMS conduct multidisciplinary research to produce and encourage quality publications in top-ranked referred academic journals and to facilitate connections with industry partners to provide solutions to business, community and government organisations. We are privileged to have an exceptional community of researchers at LUMS.

Since 2010, Office of Sponsored Programmes and Research (OSPR) is responsible for bridging the gap

between LUMS faculty and national and international donors and to ensure that research and innovation creates new information and pushes the boundaries of knowledge for the development and transformation of society. Our researchers maintain a national and international reputation in their respective fields. In addition, many faculty members serve in professional capacities at local, national and international levels.

During 2016-17, research accomplishments of the faculty have won 127 externally funded grants (including research, travel, conference and consultancy) of PKR 473,291,033. Apart from that, one hundred and fifty-five (155) faculty members have won 156 research grants worth PKR 96,294,534 from LUMS internal funding. The objective of signifying these figures is to highlight the pioneering accomplishments and innovative achievements of the LUMS faculty that have made LUMS a regional centre of excellence today, evident from its international rankings, and also to provide an opportunity to further develop research collaboration activities for LUMS.

Pursuant to our mission of supporting LUMS faculty members in their research endeavours, OSPR is committed to coordinate, monitor and provide an enabling environment for innovative research and commercialisation of research outputs to meet the changing needs of society and for sustainable development.



Dr. Syed Zahoor Hassan, Professor at Suleman Dawood School of Business (SDSB), has been involved in helping organisations formulate their aspirations and strategies. Using his extensive experience in research, management education and consulting, Dr. Hassan has facilitated the process of strategy formulation at a number of companies in different business sectors. His recent engagement with one of the leading and most diverse business groups, with companies in manufacturing, services and financial sector, focused on formulating group shared aspirations: core values, mission and vision.

FACILITATION OF FORMULATION OF GROUP VISION, MISSION AND VALUES

With growing competition and related challenges it has become very important for organisations to articulate their aspirations to effectively align and motivate both their internal and external stakeholders. In Pakistan, many business groups have expanded in different business sectors but have not been able to develop clearly articulated group identities and aspirations.

Companies in a leading business group of Pakistan (that has a range of companies headquartered in Karachi and Lahore) worked quite independently with very little in common except for some level of shared ownership, approached Dr. Syed Zahoor Hassan to lead the effort for formulation of a shared group mission, vision and core values.

"To me, it seemed quite worthwhile because I believed that these set of companies as an integrated entity with shared aspirations, could generate more value through more effectively leveraging business opportunities, and attracting and retaining top-quality talent," explains Dr. Hassan.

The first challenge was to convince the senior management at various group companies that an overall group level approach will bring value to all concerned. Interestingly, most individuals working in these companies had been working in the same business units for many years and had not moved across companies. Moreover, in order to develop a deeper commitment to this initiative across and within the organisations, a bottom-up approach was followed. Each company was asked first to internally discuss and come up with their respective core values, mission and vision statements.

Workshops were held in Karachi and Lahore to develop motivation for the need to have group level aspirations and develop initial drafts of the shared aspirations. These drafts were separately discussed and debated in each

company with the help of the Group HR. Feedback from the companies was then used by a team of senior managers from across the companies to arrive at the final version of draft aspirations and identify the tasks for implementing the agreed core values.

Dr. Hassan explained that this exercise created a shared way of looking at things as more than 50 senior managers from different industries, cities (including Lahore and Karachi) and from different backgrounds and experiences came to work together. For example, people who had spent their entire career at this group and were more accustomed to the old ways of working at group companies and those who had been recently inducted and also came from different sectors, worked together in this exercise. This helped create a new group identity that leveraged a broad range of perspectives. It also helped evolve a better appreciation for the opportunities and challenges that the group needed to address collectively and fostered a sense of common purpose and camaraderie among senior managers in the group companies. In this process, Dr. Hassan's main objective was to structure and guide the discussions so that a shared consensus could emerge.

Reflecting on this project, Dr. Hassan said, "It was my extensive experience, past exposure and relationships with a wide range of senior executives from different industry sectors that enabled me to manage this whole process. At the same time, this project also helped me develop a deeper understanding of the various businesses that this group is involved in. I probably gained equally from this project as such projects offer great two-way learning opportunities. The insights gained from such projects have helped shape the themes of my MBA elective course, Strategy and Management in Developing Economies".



REGULATORY INCENTIVES FOR FOREIGN DIRECT INVESTMENTS: BIT'S, TARGETED PARTNERSHIPS, SEZ'S, AND ISLAMIC FINANCE



Professor Uzair Kayani, Visiting Assistant Professor at the Shaikh Ahmad Hassan School of Law (SAHSOL) specifically undertook for the American Business Forum (ABF) a demand driven research set to explore the dynamics of Foreign Direct Investments (FDI). Extremely important for a developing country like Pakistan, Professor Kayani's work is significant for resurrecting Pakistan's fledging and collapsing economy in the light of FDI's leading role.



Today, in the business sector of Pakistan, Foreign Direct Investment (FDI) could be a real game changer and one that could prove to be a key breakthrough in resurrecting Pakistan's faltering economy.

Realising the importance of Foreign Direct Investment, Professor Uzair Kayani, Visiting Assistant Professor at the Shaikh Ahmad Hassan School of Law (SAHSOL) indulged in bringing the legal and economic aspects of FDI in Pakistan to the limelight through his intensive research. Specifically undertaken for the American Business Forum (ABF), a conglomerate of a number of multinationals working within Pakistan, the research set to explore the dynamics of FDI.

Meanwhile, being an expert in commercial law, Professor Kayani was naturally drawn to the fields of economics and business. It was at this melting pot of ideas that he happened to encounter an intellectual question that why economically



extensive research, Fatima Wahla fully supported him as a research assistant.

“The data available through the State Bank is already segmented. This was used as the basis to collect detailed data on relevant transactions between businesses. An example is the widely covered merger between Mobilink and Warid. The information on these transactions is available in different forms of the media and the business and commerce sector. All this extensive research acted as raw data for further studies,” elaborates Professor Kayani.

The next step was to explore the legal implications of FDI. This happened to be a two-part analysis. The first part examined the enforcement aspect of FDI that dealt with the efficiency of the bureaucracy in implementing the laws. This was conducted using the World Bank Data Rankings of businesses and statistics. The second part involved looking directly at the laws; what the laws are, how are they implemented and how they reflect the trends shown. Some of these laws are linked to previous case laws which are also thoroughly analysed.

Professor Kayani states that FDI is extremely important for a developing country. He states that FDI helps in bringing foreign exchange, business expertise and acumen and it is also more secure than portfolio investment as the firms tend to have larger stakes in the business and do not immediately take off in case of emergencies.

With hard work, vision and perseverance, Professor Kayani can be at the centre of a far-reaching research that would provide both the government and business sector with very authentic and credible data on FDI. This could be significant for resurrecting Pakistan’s fledging and collapsing economy in light of FDI’s leading role.



similar countries tend to have quite different levels of FDI. This moment of intellectual insight turned into a driving force for Professor Kayani to pursue the project. At the same time, his motive to take up this research was significantly demand driven and practical.

“In a developing country demand driven research is of great importance and considering the influence that FDI has created in Pakistan’s economy, members of the industry and government are frequently looking for individuals with authentic and valuable insight on the subject,” explains Professor Kayani.

As for his project, he first looked at the historical perspective of FDI by analysing data that was already available in the form of newspaper articles announcing major economic activities related to FDIs and the industries were divided into specific segments. For all this





Dr. Kashif Zaheer Malik, Assistant Professor at the Department of Economics at the Mushtaq Ahmad Gurmani School of Humanities and Social Sciences (MGSHSS) has been working in the area of microfinance for the past 5 years. In his recent work, he is testing a micro-equity product for micro-enterprises. This project is being implemented in collaboration with the University of Oxford and Akhuwat - a leading microfinance organisation. Dr. Malik's research has been exploring whether micro-equity finance can bring about a positive economic change not only in Pakistan but also in the world at large. The timing of study is crucial since the conventional microfinance industry is facing a lot of challenges to reduce poverty.

EQUITY-BASED MICROFINANCE CONTRACTS FOR MICROENTERPRISES

Microfinance, also called microcredit, is a banking service that allows unemployed or low-income individuals or groups, who have limited resources to acquire financial services. Ultimately, the goal of microfinance is to give impoverished people an opportunity to become self-sufficient. The modern phrase of what we now know as microfinance emerged as a movement during the 1970s by the Grameen Bank headquartered in Dhaka, Bangladesh. Its pioneer, Muhammad Yunus had one goal, that was to create a financial utopian society where everyone, especially the financially inept and socially marginalised households could have access to a wide range of products that are of high quality as well as affordable.

At LUMS, Dr. Kashif Zaheer Malik along with the research team from Oxford is looking to delve into a previously unexplored sector in microfinance called, micro-equity financing. Micro-equity financing is a profit and loss sharing product. It primarily allows entrepreneurs from financial impoverished backgrounds to start small businesses; focusing primarily on allowing investors to connect with budding entrepreneurs to invest in the business through microfinance.

"I was really interested in microfinance and while reading about it, I found out that products within microfinance are not really bringing about any change in terms of socio-economic development," explains Dr. Malik.

His initial interest in the subject was garnered from reading and researching microfinance.





While conducting his initial research he realised that microfinance was not the catalyst for curbing poverty that economists expected it to be. Therefore, he then began to look for new possible solutions.

His aim is to work on the principle of micro-equity financing, where instead of just lending money, microfinance institutions will help to invest in a risk-sharing product in the form of fixed assets. The idea behind this is to involve the skill of the client through the acquisition of a mutually funded asset like a rickshaw or an ice cream machine. By doing so, the hope is to raise them to a better socio-economic level by sharing the business risks with them.

Through his research of equity-based microfinance, he hopes to create a mechanism where the client's skill and the firm's financial muscle could be put to good use. Thus, the firm will initially own the start-up business or asset but over time the entrepreneur will be able to buy back the said asset. This allows the financial firm to also share losses as compared to mainstream banks that although follow a microfinance business plan, do not share the risks with the client.

While thinking along these lines, Dr. Malik along with his team was naturally drawn to Akhuwat, an organisation that had been practising Islamic Microfinance for quite some time. At Akhuwat, its Chairman, Dr. Amjad Saqib endorsed the idea and hence they began to work on the Micro-Equity Product.

To make this an appealing global product, Dr. Malik first had to prove its efficiency. For this, it has taken more than 2 years (beginning in 2015) to screen potentially viable clients. It involves 900 clients with fixed contracts

(contracts where clients have to buy back assets at a fixed time, paying a fixed amount monthly) and flexible contracts (contracts where clients can pay back for assets over a longer period of time, however, there is no monthly fixed amount). The process involves a system where the clients are primarily extensively surveyed and then recruited for the project.

Meanwhile, to cover the extensive costs of the research and the project, the team was successful in acquiring a \$300,000 grant from the Melinda and Gates Foundation to cover the research costs. Additionally, Akhuwat was generous enough to add PRK 20 million to the project.

The whole idea was to introduce a product acceptable to people of all classes and religions; not to be sold as an Islamic-micro financing but as a micro-equity product with profit and loss sharing. Dr. Malik reinforces that he wants to assess that equity products are better than debt products as this is bound to bring a socio-economic change in society. He hopes that by providing microfinance, financially crippled individuals will be able to run their own businesses that will not only make them self-sufficient but also stimulate the economy through the emergence of small enterprises.

"The main problem we face is that people are familiar with debt products. If you ask them to share the risk, they will hesitate. Enough empirical evidence exists which suggests that debt products are risky. If the equity-based product is successful, then all micro-finance can be replicated and eventually this will change the micro-finance industry," adds Dr. Malik.





Dr. Shakeel Sadiq Jajja, Assistant Professor at the Suleman Dawood School of Business (SDSB) provided consultancy services to the Planning and Development Department (P&D), Government of the Punjab (GoP), to develop a comprehensive and objective evaluation criterion for the pre-qualification process that resulted in a list of pre-qualified companies to be used by GoP for the fiscal year 2017-18.

EVALUATION OF PREQUALIFICATION OF CONSULTING VENDORS FOR GOVERNMENT OF THE PUNJAB (2017-18)

Given the economic crisis developing countries endure and live through every day, it is necessary that innovative ideas are put forward. This helps in not only managing their limited budgets, but also ensures development in all factions. As it stands, to facilitate infrastructural growth in the province, the Government of Punjab (GoP) often finds it challenging to do so smoothly since it cannot act in multiple capacities that include planning, execution, monitoring, etc. Therefore, the need for consulting companies arises.

The task of pre-qualifying firms, who may provide consultancy services to GoP, in various industrial sectors falls upon the Directorate General Management and Evaluation Department (DGME) of the Government. These firms can be engaged on time to time basis by line departments, public sector companies and authorities of GoP under the Punjab Public Procurement Regulatory Authority Rules 2014. Once pre-qualified, unfit companies are filtered out of the process, only leaving the ones that have the potential to efficiently execute the consulting assignments. Shortlisting or prequalifying companies in twenty-four sectors, ranging from power, energy and hydrology to planning, legal and public and private partnership, is not an easy task.

"Hiring the right companies for the right job is absolutely necessary. About ten percent of Pakistan's GDP is spent on public sector expenditures of which seventy percent is spent on development projects. Research shows that best procurement practices can save on average 28 percent of public sector procurement spending on these projects in developing countries. If we save just four percent in a year we can save PKR 3.2 Billion which is more than the official budget of Lahore Metrobus project i.e. PKR 3 Billion. Right process of pre-qualification by GoP is a key procurement practice. Putting into account the large expenditures being made in consultancy companies, it is crucial to understand how making a single wrong decision renders such a large sum of money useless and actually puts a phenomenal dent on an already scarce development budget," explains Dr. Jajja.

Given his area of expertise, Dr. Jajja, who has previously worked with the government on procurement management

and had directed and taught in several programmes for government officials was approached again by the GoP to evaluate the process of selecting suitable firms from nearly 325 expressions of interest for 24 different sectors.

"The issue that needed to be tackled was the selection criteria itself. The process had to be transparent, competitive, and fair and at the same time discriminate between good and poor firms. One wrong choice in developing and executing the evaluation process would result in substantive loss to the government and undesirable impression to the stakeholders," remarks Dr. Jajja.

The next step was to approach the authorities and highlight his genuine concerns. At this point he was not left disappointed. The GoP was genuinely interested in hearing him out and gave him the freedom to explore and figure out the pitfalls of the system, and uproot them completely to maintain the process sanctity.

Dr. Jajja now set to design a perfect evaluation criterion for the pre-qualification. During his exhaustive research, he identified important improvement opportunities in the evaluation process and in collaboration with the government officials came up with a comprehensive, well-aligned with prequalification goals, objective evaluation criterion. Through his work, he validated that the new system was reasonably fair, competitive, transparent and efficient.

Certain benchmarks were successfully identified so that competent firms were brought forward as pre-qualified firms to provide consultancy services to GoP in various industrial sectors and who would be engaged on time to time basis by line departments, public sector companies and authorities of GoP under Punjab Public Procurement Regulatory Authority Rules 2014. Dr. Jajja achieved the objective of the consultancy services to guide the P&D team in the right direction.

"Self-scrutiny by GoP is a key and basic step in the right direction," comments Dr. Jajja.



CONTEXTUALIZING DIVERSITY MANAGEMENT IN THE MIDDLE EAST AND NORTH AFRICA: A RELATIONAL PERSPECTIVE



Dr. Jawad Syed, Dean and Professor of Organisational Behaviour at the Suleman Dawood School of Business (SDSB) along with Sophie Hennekam and Loubna Tahssain-Gay, ESC La Rochelle School of Business, France worked on how diversity management in the Middle East has been found to achieve outcomes such as better utilising talent and increasing creativity leading to better overall performance. Dr. Syed distinguished between macro-level, meso-level and micro-level factors of diversity and highlighted their interrelated nature to develop an integrated and contextual approach to diversity management.

Dr. Jawad Syed's work aims to identify and provide a framework to managers who are trying to implement diversity policies and practices. It is important to understand the extent to which individual experiences vary based on their gender, ethnicity, faith, class and other dimensions of diversity. The relational framework shows that understanding of the macro-level, meso-level and micro-level factors is important when deciding how to implement Western diversity policies in Middle East and North Africa (MENA) countries. More precisely, little or no understanding of the local context leads to a strategy in which managers force a Western approach upon the country.

The study points towards the latent tensions between the power of MNCs (or their diversity/human resource managers) and the local context in terms of framing and implementing diversity management. Here, the role of power may also be considered in terms of how managers dealt with transferring Western diversity policies to foreign territories.

Dr. Syed chose this subject along with his colleagues in France to examine the conflict between diversity policies as designed in the West and the challenges in implementing these in the MENA region. For the study, 20 HR and/or diversity managers working in multinational companies in nine different countries of the MENA region were interviewed. These managers were chosen because their position enabled them to provide an overview of the challenges related to diversity management in their organisation and because they had a key role in shaping the outcomes of diversity interventions.

Multinational companies operating in the MENA region were selected randomly. Forty-two MNCs were contacted by e-mail and by telephone, and participation in the study was requested through interviews and questionnaires. Thirteen managers were HR managers, who were also responsible for diversity management. However, in seven cases, the organisations had a dedicated diversity manager.

The data and the interviews show that, firstly, Western approach towards diversity management is forced upon the local country, ignoring local realities. Secondly, it was observed, existing local policies were kept in place but reframed so they would fall under diversity management policies as the way it is understood in the West. This fails to truly commit to diversity because it does not address the issues minorities and other marginalised groups face, leading to an empty rhetoric. Lastly, the sensitive approach strategy consisted of being sensitive to the macro-level, meso-level and micro-level factors that shape the cultural and institutional contexts. The special needs of minorities and disadvantaged groups were acknowledged and barriers to manage diversity were identified. Gradual and incremental change, mainly through raising awareness, was typical to this approach.

Macro-level, meso-level and micro-level factors of diversity stand distinguished in the



study. Their interrelated nature was highlighted to develop an integrated and contextual approach to diversity management. At the macro-national level, the framework takes into account the significance of national structures and institutions such as laws, social organisation, religious structures, and gender and race relations. It is the all-encompassing domain within which all other layers exist. The macro-level as they are characteristic of the MENA region: the Islamic faith, the patriarchal structure and the modernisation process at different speeds. At the meso-organisational level, the article considers the organisational processes and routinised behaviours at work. Finally, the micro-individual level includes factors like individual agency, motivation, identity and various forms of human capital that influence individual capabilities and opportunities as research has shown that individual power, motivation and agency are key to deal with challenges. Regarding the implementation of diversity policies, three broad strategies used to deal with the perceived clash between Western diversity practices and the local context in the MENA emerged from the data.

For future, Dr. Syed plans to add other under-researched MENA countries in order to broaden the sample and advance knowledge of this region. The research paper identifies three broad strategies regarding the way in which managers do or do not adapt the Western diversity policies to the MENA countries. Further, it would be interesting to know how prevalent and how successful

those strategies are. In order to do this, the paper recommends a quantitative questionnaire that could determine the strategy of an HR/diversity manager. That will be useful in measuring how this strategy is perceived by individual employees and how much progress in terms of equality and inclusion is actually being made. It is also suggested that other contextual factors, such as the familiarity of the manager with the country in which he/she operates, but also his/her training and the underlying rationale of the MNC towards diversity, are likely to influence how HR/diversity managers transfer diversity policies and programmes to non-Western contexts.

At the end of the study, it was understood that organisations, including MNCs, should not be recreating colonial tropes to guide our approach to diversity. The latent tensions between the power of diversity/HR managers of MNCs and the cultural context about using or ignoring diverse talents may be contextually resolved through a relational approach, considering the multilevel factors highlighted in this article. Furthermore, organisations need to take the challenges of transferring diversity policies to other national cultures more seriously and that they should assist their HR/diversity managers in how they should adapt their policies and practices. The findings stress the importance of taking into account the macro-level, meso-level and micro-level factors in understanding structural issues that are difficult to tackle.



Dr. Syed Aun Raza Rizvi, Assistant Professor at the Suleman Dawood School of Business (SDSB), conducted a research to explore equity financing within the economic international climate and the stability it provides over conventional forms of financing.

STABILISING ECONOMIC GROWTH THROUGH RISK SHARING MACRO INSTRUMENTS

Dr. Syed Aun Raza Rizvi's research originated from an interest in Islamic economics and a general observation of the emerging markets' economy. The idea that had struck a chord with the professor for some time was that the concept of Islamic economics could not be as basic as a legal compliance of banking products. The wisdom of Allah's commandments goes beyond mere legal interpretations and must have a long-reaching inclusive shared stake in the economic spoils of any nation. This led to an exploration of the theme of Islamic economics and finance, which lies in the risk-sharing principle of economics. As it goes, the development of early European city-states was founded upon the principle of sharing risks. This principle helped these city-states develop their infrastructure and rule their western landscape in terms of science and economy.

In essence, the research idea was born to explore whether there is a risk-sharing financial instrument which may address the woes of the emerging nations. In addition, which financial instrument is also in compliance with the Shariah and thus satisfies the religious sensitivities of the masses. The idea was to develop and test an instrument, which is not a mere legal compliance to Islamic law as most Islamic financial instruments are but an instrument, which fits in with the true spirit of risk sharing.

This led Dr. Rizvi to explore if risk sharing, which forms the crux of Islamic economics, can still be witnessed in other parts of the world. The exploration led to finding traces of the principle in current western financial systems in the form of venture capital financing, albeit the primary focus has diverted to risk shifting-based debt financing.

While exploring the progress of emerging economies and especially Islamic finance over the past decades, much effort and research have gone into establishing a viable set of Islamic financial institutions. Most Muslim nations are heavily indebted with high reliance on multilateral financing primarily based on high-interest rates. This vicious cycle of interest rates and debts has stunted the

growth of these nations and worsened the conditions for the masses.

Dr. Rizvi's research brings to the forefront the concept of equity in nature GDP-linked paper, which allows for enhanced risk sharing-based sovereign financing. It aims to present empirical proof of the stability this instrument offers in economic growth, for a large sample of developing economies, comprising the bulk of Islamic countries. While analysing the empirical work, a strong favourable argument for this instrument is derived for its benefits instability.

Through this study, we endeavoured to initiate a thought-provoking and practical discussion for further development of these instruments for the betterment of developing countries. The impact and the final implementation of this instrument is still something that needs to be seen. There needs to be an intent and sincerity from the policymakers to explore and accept equity in nature instruments. Meanwhile, the heavy dominance of Islamic legal experts and Shariah scholars within the field of Islamic finance with the sole focus on legal compliance is a challenge to a wider acceptance of this instrument. Will this instrument see the light of the day? This remains to be seen.



ISLAMOPHOBIA AND SECURITIZATION: RELIGION, ETHNICITY AND THE FEMALE VOICE



Assistant Professor at the Department of Humanities and Social Sciences at the Mushtaq Ahmad Gurmani School of Humanities and Social Sciences (MGSHSS), Dr. Tania Saeed's research explores the intersection between gender, ethnicity, religion and security through biographical accounts of Muslim Pakistani female students and British Muslim students with a Pakistani heritage studying in universities around England that capture experiences and encounters with Islamophobia and the British state's counter terrorism agenda.

A graduate of the LUMS BSc class of 2005 and now a faculty member at the Humanities and Social Sciences department of LUMS, Dr. Tania Saeed's book *'Islamophobia and Securitization: Religion, Ethnicity and the Female Voice'* explores everyday realities of young Muslim women in Britain, who are portrayed as antithetical to the British way of life in media and political discourse. The book captures how geo-political events, and national tragedies continue to implicate individuals and communities at the domestic and local level, communities that have no connection to such tragedies and events, other than being associated with a religio-ethnic identity. Dr. Saeed shows how Muslim women are caught within the oxymoronic spectrum of the vulnerable-fanatic, always perceived to be 'at risk' of being 'radicalised'. Focusing on 'educated' Muslim females, the book explores experiences of Islamophobia and securitization inside and outside educational institutions, and highlights individual and group acts of resistance through dialogue, with Muslim women challenging the metanarrative of insecurity and suspicion that plagues their everyday existence in Britain.

The subject was the focus of Dr. Saeed's doctoral work at the University of Oxford. When she was studying in Oxford, it was at a time when the 'Afghanistan-Pakistan' problem was constantly in the news, with Pakistan described as the 'hub of terrorism' in media and political rhetoric. "I had also heard of Pakistani students struggling with getting visas to study in the UK, and the more I inquired the more I learned about an unease around both the Muslim and Pakistani identity amongst students in different universities. In this initial inquiry, I came across the Justice for North West 10 (J4NW10) campaign that was started by mostly left wing groups to prevent the deportation of ten Pakistani students who had been accused of terrorism, but were found 'not guilty' by the British courts, yet were being unjustly deported, many in their final year of university. This was also a time when the British government's counter terrorism agenda, in particular its focus on Preventing Violent Extremism started including educational institutions within its security agenda, operating on the flawed assumption that a 'process' of radicalisation exists that can be interrupted at certain points, the educational space being one of those points of interruption. A problem that I also noticed was how the narratives of young students were often absent in any discussion about them, especially Muslim women," she said.

Dr. Saeed said that the aim of the project was to explore experiential accounts of Islamophobia and the British state's counter terrorism agenda, focusing on the intersection between religion, ethnicity and gender within a securitised context. "The intersection between the Pakistani and Muslim identity was particularly important in highlighting how certain groups within the Muslim community may be more vulnerable to experiences of Islamophobia, because of the social and political context that inform their

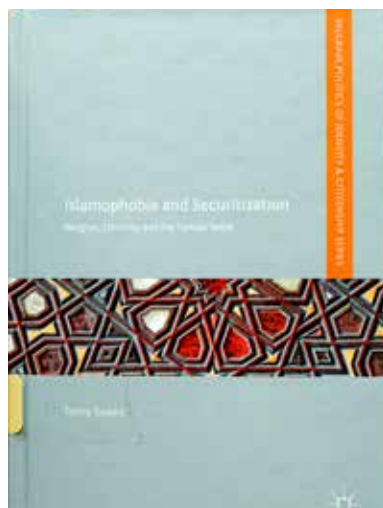


day to day existence. My participants included women with different degrees of religiosity, from those who wore the niqab, the hijab, the shalwar kameez, to those with no physical religious or cultural identifiers, that highlighted different degrees of discrimination. The project also examined narratives of resistance amongst students who were challenging the metanarrative about their identities through individual acts of dialogue, or through student society activism, many of whom later became involved in local body politics outside the university," revealed Dr. Saeed.

Explaining how the research was conducted, she said that the field work for the project was undertaken between 2010-12. The national data on student distribution across universities, was examined, selecting universities with a large South Asian student body and those with a small South Asian student presence with the aim of exploring differences in experiences. The universities were located in London, West Yorkshire, North and South West England, North and South East England, and the West Midlands. Students were contacted through Islamic student

societies and Pakistani student societies. Adopting a narrative approach, forty biographical narratives were collected over a two-year period, as well as interviews with welfare and racism officers, and representatives of national student groups. Content analysis of publications by student Islamic societies and universities relating to discrimination was also undertaken. "While the research does not claim generalisability, though certain trends are observable in other studies about Muslim communities, a survey was nonetheless undertaken to examine the prevalence of the issues that emerged through this narrative study, for students across different universities," she said.

Dr. Saeed's study has not only been instrumental in challenging stereotypes but also in providing insights about the problematic nature of counterterrorism policies. "The book is useful for both academics working on Muslim communities and policy analysts not just in the UK, but in my experience also in Europe and the US. I have been giving book talks in the US where the insights from this book are particularly relevant, given the attempts by the recent administration to impose a 'Muslim ban' that implicates certain Muslim majority countries, again highlighting the importance of recognising how different Muslim identities are implicated in the political discourse. I have been invited by institutions like The Carter Center, and the British Council US to take part in policy discussions on Islamophobia and have also contributed a piece on Islamophobia related to my research in the forthcoming Carter Center report. At the community level, the response from different members of the British Muslim community has also been positive in instances where I have presented my research in community led events. The importance of the book is to provide insights to inform policy and academic debates where the narratives of British/Muslim/Pakistani women are at the centre of the conversation, rather than pushed to the periphery," shared Dr. Saeed.



FOUNDATIONS OF RELATING: THEORY AND EVIDENCE ON THE FORMATION OF STREET-LEVEL BUREAUCRATS' WORKPLACE NETWORKS



Dr. Muhammad Azfar Nisar, Assistant Professor at the Suleman Dawood School of Business (SDSB) explores factors responsible for the formation of street-level bureaucrats' informal communication ties at the workplace and how managers can leverage on them to implement workplace reforms.

It has long been recognised that workplace relationships represent an important dimension of bureaucratic behaviour. Indeed, the general significance of informal peer relations among organisational employees has been noted since the Hawthorne studies in the early 20th century. This intra-organisational network of work relations influences and constrains organisational behaviour in many significant ways, prompting Krackhardt and Hanson to label it the 'central nervous system' of organisations.

Perhaps nowhere have work relations been more emphasised than in the literature on street-level bureaucrats—organisational employees who directly interact with clients—where a prominent theme has been the significance of peer interactions in forming role expectations, fostering group identity and facilitating job learning. Work relations are especially important for street-level bureaucrats because of high work demands, limited resources and uncertain job environment. Work relations of street-level bureaucrats can also serve as conduits of information and knowledge transfer through which street-level bureaucrats learn to get things done. Moreover, the importance of peers is of particular managerial consequence in the introduction of reforms or innovations, where new behaviour is required on the frontline. Peer relationships in such situations can provide material resources that help frontline workers make sense of and implement desired changes.

Despite its obvious scholarly and practical importance, there has been little theoretical or empirical work on understanding the micro-social foundations of peer selection among street-level bureaucrats. Through their research titled, *Foundations of Relating: Theory and Evidence on the Formation of Street-Level Bureaucrats' Workplace Networks*, Dr. Muhammad Azfar Nisar and Dr. Spiro Maroulis of Arizona State University wanted to address this critical theoretical and empirical gap in public administration studies. Specifically, they wanted to understand the extent to which behavioural and structural attributes are associated with the existence of informal communication ties among street-level bureaucrats and how this information could be of help in managing innovation and reform efforts in public organisations. To do so, they developed specific hypothesis by adapting insights from social capital and social exchange theories, to empirically analyse the micro-social foundations of



street-level bureaucrats' decision-making regarding peer selection.

The data for this project was collected from 101 teachers, an important group of street-level bureaucrats, at a large public school in the United States. Analysing teachers' workplace relations also had the additional benefit of providing a context where individuals often access resources, particularly tacit expertise about the complex task of teaching, through informal social networks. For their analysis, the research team estimated an Exponential Random Graph Model (ERGM) of the likelihood of a directed tie existing between two teachers.

They found that teachers were more likely to discuss work related issues with peers who possessed characteristics such as innovativeness and experience, and that those relations were also characterised by reciprocity and closure. Their findings are consistent with predictions of the social capital perspective which posits that peer selection can be viewed as an instrumental investment influenced and constrained by one's social network. It also implies that the introduction of change initiatives, in addition to potentially changing the way work is done within an organisation, can also impact its internal social dynamics in a manner that favours some frontline workers over others.

Moreover, Dr. Nisar's study highlights the importance of integrating economic and sociological perspectives when analysing bureaucratic behaviour. That is, the theoretical model developed by the research team included the instrumental considerations of peer selection in line with the hypothesised rationality of the 'economic man', and higher-order, structural aspects of peer selection in line with choices of the 'social man'. The research team found

evidence of both, implying that the benefit-cost calculus of peer selection among frontline workers is bounded by the surrounding web of social relations making some choices more likely than others. It also reinforces the need for an integrative analysis of individual choice within public organisations.

This research project also has important management implications for public sector managers. As frontline workers can identify and seek peers who possess resources most valued by an improvement initiative, such efforts may alter the informal balance of power within the frontline of an organisation. Moreover, having such individuals who are in high social demand on board at the time of a planned organisational policy change may increase the likelihood of success of its implementation. Workplace relations are an important aspect of work identity of bureaucrats and failure to take them into account could limit the impact of human resource practices and team formation within organisations. Public managers need to be cognisant of these factors during design and implementation of policies aimed at organisational change.

Dr. Nisar is keen to disseminate the findings of this study through linkages with public, non-profit and private organisations. "As director of the LUMS Centre of Governance and Public Management (CGPM), I am planning to develop policy briefs on relevant research of our faculty to disseminate the key findings in the form of easily understandable managerial implications to key policy makers in Pakistan. That is one way to achieve increased impact and outreach of research conducted by LUMS faculty," he said.



TECHNOLOGY



Dr. Naveed Ul Hassan, Associate Professor at the Department of Electrical Engineering, Syed Babar Ali School of Science and Engineering (SBASSE) believing that resource conservation is the need of the hour, made use of wireless communications and Internet of Things (IoT) for the benefit of conserving water and energy.

TARGETING CONSUMER BEHAVIOUR FOR RESOURCE OPTIMIZATION IN BUILDINGS USING INTERNET OF THINGS AND MACHINE TO MACHINE COMMUNICATIONS

In today's environment, climate change is very much a reality. Electricity and water shortages in Pakistan are a constant issue affecting the common man. "People are generally inconsiderate when it comes to saving power, whether it is at our office meetings, family lunches or other daily activities. Many of us are also not concerned with saving water and let the tap run while performing routine activities. A few years back, I also had the same habit. Unfortunately, many of us remain unaware of this wastage, although this directly results from our own resource consumption behaviour," explains Dr. Naveed Ul Hassan, Associate Professor, Department of Electrical Engineering (EE) at the Syed Babar Ali School of Science and Engineering (SBASSE).

Consequently, Dr. Naveed decided to put to use wireless communications and Internet of Things (IoT), his main area of research interest to the benefit of conserving water and energy. A seed grant provided by LUMS Water Informatics Centre (WIT) helped in a pilot study. Dr. Hassan along with his team developed and installed nodes (sensors) to a pantry sink at the EE Department, SBASSE. The communication module on the node helped transmit data to the main computer where this information was being recorded for several days. Water consumption of the users was thus monitored. Using Machine Learning (ML) techniques, the collected data was used to identify major water consumers and the amount of water wasted in different activities. These users were then provided real time feedback for three weeks after every activity about the potential water wastage. The results showed promising reduction in water wastage (up to 50%). "This

small experiment indicates the potential of our project in modifying consumer behaviour and cutting resource wastage with inexpensive equipment, which will hugely benefit all of us," adds Dr. Hassan.

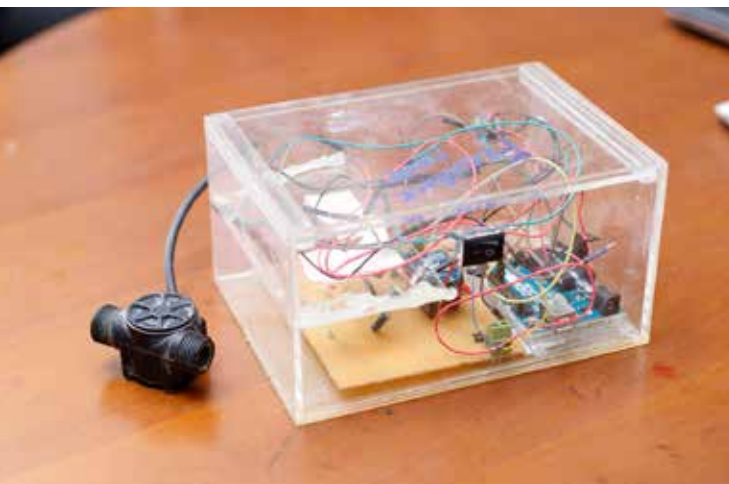
In the meantime, Dr. Hassan, drew up a proposal, which was submitted to Higher Education Commission (HEC) National Research Programme for Universities (NRPU). A grant was thus awarded for further research and development. The focus of his ongoing project is to develop and install environmental sensing nodes in various offices in his department. The data would be used to learn the resource consumption pattern of the users with the help of ML techniques and then feedback would be provided to the users to make them more responsible and resource conservationist.

The research project mainly involves observation and correction. "According to the psychological literature, human behaviour can be influenced by providing recurrent information because during decision making humans often resort to mental shortcuts and draw on readily available information. I believe that resources are not used with due care because their conservation is not at the forefront of our consciousness. Similarly, consumers may be made to think and act more rationally if feedback and information is provided to them about their consumption habits and any wastage resulting from their actions," explains Dr. Hassan.

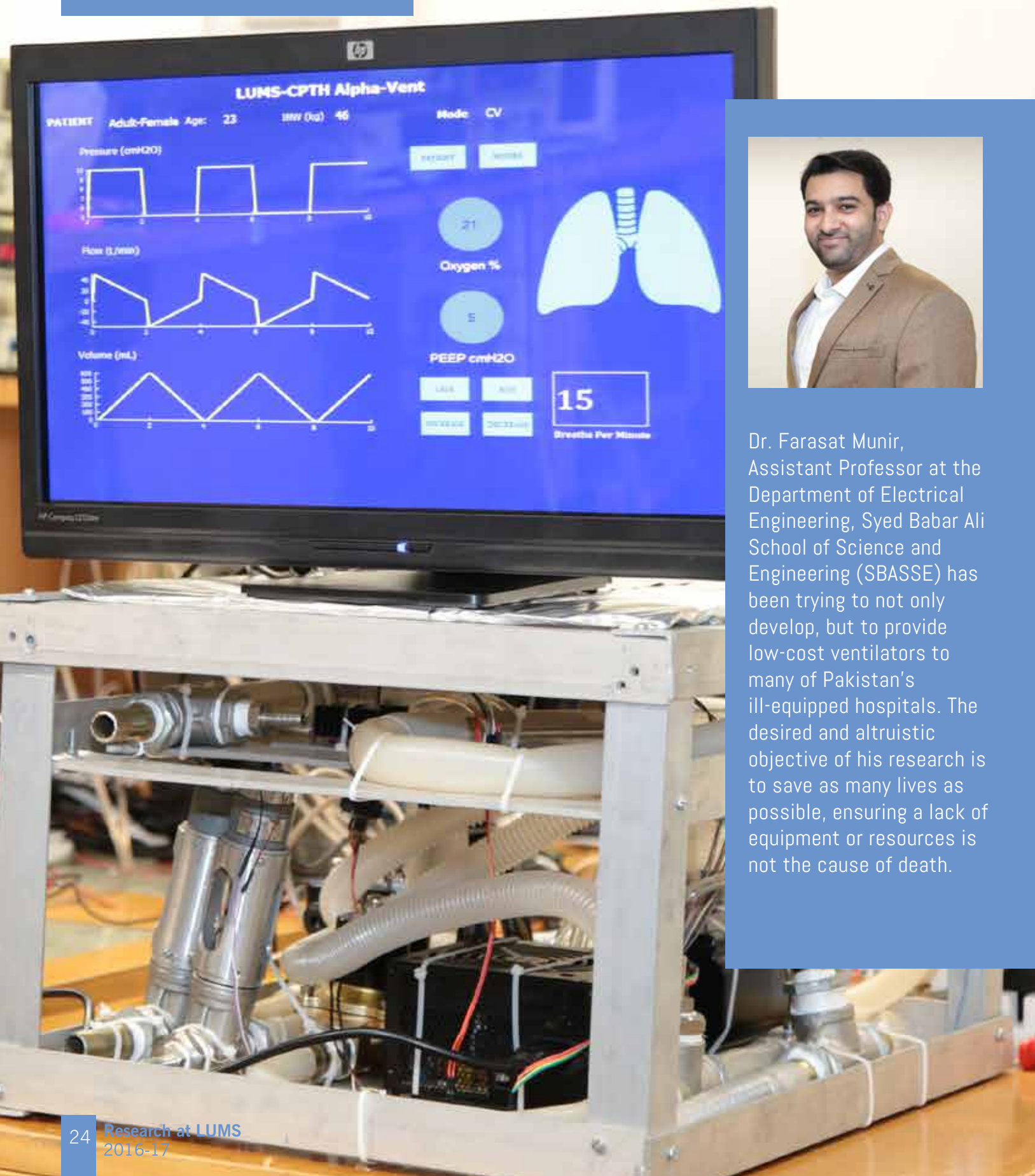
Although this thoughtful experiment was just a pilot study and Dr. Hassan eighteen-month long project which started in August 2017 has been expanded, this study has definitely produced positive results and proved that human beings will continue being careless unless they are confronted.

"Every individual in this society has a role, and if everyone starts thinking that one individual cannot make a difference, then no one will feel responsible and we will keep losing these precious resources. So in order to make an actual difference, each one of us has to play his/her role."

Dr. Hassan acknowledges the difficulties he might face but he still plans to expand his research to a higher scale.



HEALTH



Dr. Farasat Munir, Assistant Professor at the Department of Electrical Engineering, Syed Babar Ali School of Science and Engineering (SBASSE) has been trying to not only develop, but to provide low-cost ventilators to many of Pakistan's ill-equipped hospitals. The desired and altruistic objective of his research is to save as many lives as possible, ensuring a lack of equipment or resources is not the cause of death.

DEVELOPING A LOW COST VENTILATOR FOR ILL-EQUIPPED HOSPITALS

Research in the field of biomedical engineering is a field not often delved deep into in Pakistan. At LUMS, however, Dr. Farasat Munir, with his extensive research on the development of low-cost ventilators is proving the opposite. His reason for delving into this area of research is primarily due to the fact that in a country like Pakistan, which is not only on its way to prosper but to develop as well, is still stricken with a reasonably large shortage of high-end medical equipment like ventilators, which in today's age are a necessity.

Having witnessed this lack of resources in multiple hospitals himself, and seeing how often attendants are forced to manually hand pump air into patients, while also taking into account the deaths of several patients due to the unavailability of ventilators, he stresses on the unacceptability of such a situation in a city like Lahore. Keeping this situation in view, Dr. Munir embarked on designing a hospital scale ventilator in Pakistan, with many indigenous components, using local resources and expertise. Beginning this project with a group of his undergraduate students, he was able to develop a prototype, which was designed around the basic structure of an Ambu Bag (a medical ventilator bag which has to be pressed by hand). The said prototype, which housed an Ambu Bag, was automatic and pressed the Ambu Bag at fixed intervals to deliver air. The researchers, who have an insight into the inner workings of a ventilator, wholly provide this. The following year, Dr. Munir and his students built their second prototype, which interestingly was built around a Mitsubishi Pajero's air-intake blower, instead of an expensive commercial fan. This cheaper fan was beneficial as it delivers high-pressure air; a vital component, which helps, opens a patient's trachea. At this stage, Dr. Akhtar Sohail Chughtai, Dean of the Central Park Teaching Hospital (CPTH), saw the potential in the project and agreed to be the patron of the project. He arranged for funding via the CPTH and also appointed one of their best faculty members, Dr. Sadia Nasir as the medical consultant for the project.

Leveraging this medical expertise and the technical expertise gained from the design of two prototypes, Dr.

Munir and his team designed and developed a full-scale hospital ventilator. The final design consists of biocompatible and highly reliable electrical and mechanical components, and a robust system, that fulfils the standard requirements of critical medical equipment. The project is now ready to go into the testing phase, which will consist of running patient tests to finally ensure that the built ventilators can be safely used in hospitals. A team of medical doctors from CPTH will be facilitating and monitoring this process.

A hospital scale ventilator, if imported, can cost up to PKR 3 million. Large hospitals require multitudes of high-end equipment in large quantities and looking at the high costs, it is no surprise that there is a shortage of proper equipment in hospitals. If a ventilator is manufactured in Pakistan, the costs can be reduced to about PKR 0.2 million, with hardware costs going as low as PKR 150,000. Keeping this reason in consideration, Dr. Munir aims to develop his ventilator in Pakistan.

While the initial purpose behind this project was based on an altruistic sentiment, Dr. Munir also emphasises on the impact that this research can have on the advancement of biomedical sciences in the country. Pakistan is a country with numerous skilled engineers and manufacturing facilities. Yet, based on our import and export bill, much of our machinery and equipment is not manufactured on home soil. A high scale ventilator is a complex machine and by manufacturing it in Pakistan, Dr. Munir aims to spur the growth of the biomedical manufacturing industry in the country thus encouraging others to take steps that will lead to additional technological advancement.





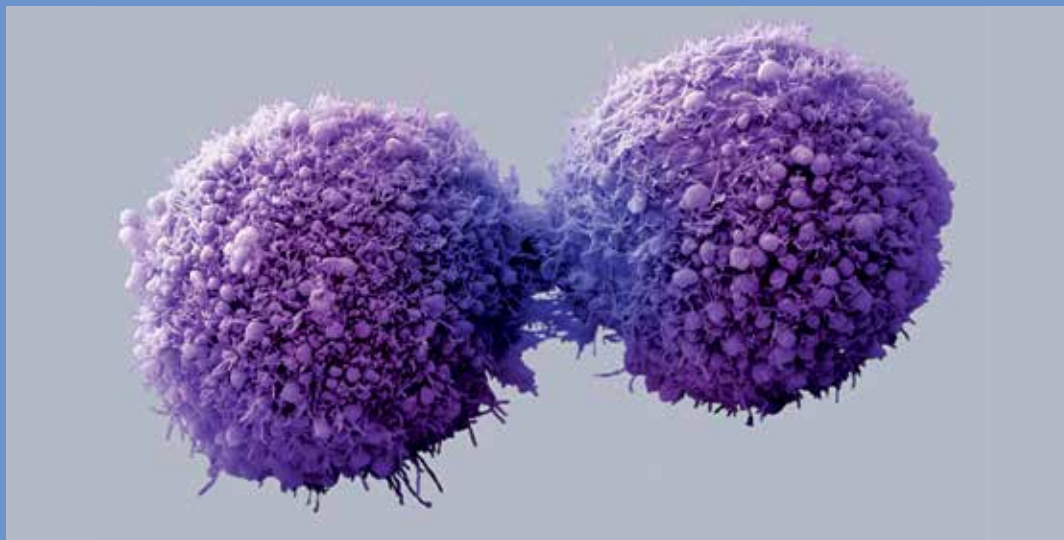
Dr. Amir Faisal, Associate Professor at the Department of Biology at the Syed Babar Ali School of Science and Engineering (SBASSE), has begun the process of identifying personalised therapies for the effective treatment of oral cancer, which is the most common cancer type among men in the country. The pre-clinical work in his laboratory will identify mutations in oral cancers from the local population and investigate various targeted drugs (alone or in combination) for the treatment of these cancers for the first time in Pakistan. Successful completion of the project will propose new therapeutic strategies to be tested in the clinic for improved treatment of oral cancer in Pakistan.

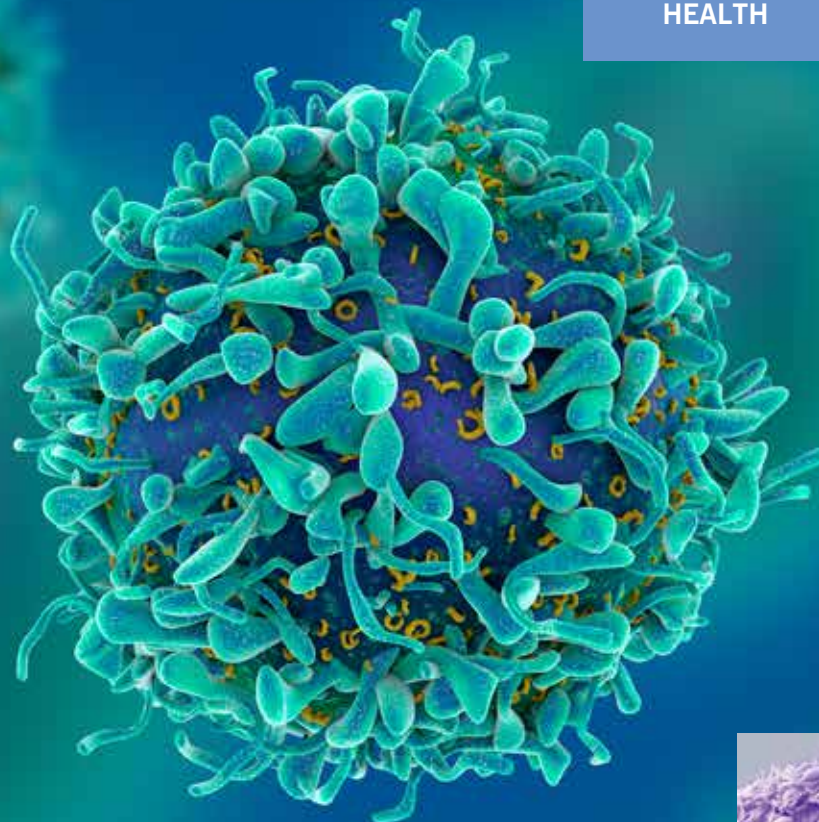
PRE-CLINICAL IDENTIFICATION AND EVALUATION OF NOVEL THERAPEUTIC STRATEGIES FOR TARGETING ORAL CANCER IN PAKISTAN; MOLECULAR PROFILING BASED PERSONALISED APPROACH

Cancer is the second leading cause of deaths worldwide with millions of people diagnosed with it annually and over half of them eventually dying due to the disease. The vast majority of cancers are caused by lifestyle choices and environmental factors. The incidence of different types of cancers, therefore, varies greatly from one population to another. Oral cancer, for instance, is highly prevalent in South Asia, mainly due to excessive smoking and chewing of tobacco, beetle quid, and gutka as well as poor oral hygiene. In Pakistan, oral cancer is the second most common type of cancer and accounts for nearly 10% of all newly diagnosed cancer cases.

The etiological differences of these cancers from Pakistan mean they may have distinct genetic profiles that contribute to tumour development. The distinct mutational landscapes of various cancers dictate their sensitivity to specific chemotherapeutic and targeted drugs. Dr. Amir Faisal's research aims to identify and characterise novel therapeutic strategies for targeting oral cancers of Pakistani and South Asian origin.

Cancers of the lip and oral cavity account for nearly 300,000 new cancer cases a year (2.1% of all cancer cases) worldwide resulting in the death of half the people diagnosed with it. Although these cancers are highly prevalent among men in South-Central Asia and Central and Eastern Europe, the mortality is disproportionately high in developing countries, presumably due to late diagnosis and limited access to quality treatment. In Pakistan, there is a prevalence of more than 12,000 new cases of oral cancer every year (8.6% of all cancer) that





are responsible for 7.2% of deaths (7266) caused by cancers annually.

Dr. Faisal's interest in this specific research stems from the fact that there have been very few studies in Pakistan for molecular characterisation of oral cancer and no studies to evaluate targeted drugs for the treatment of these cancers either pre-clinically or in the clinic. It is, therefore, important to characterise oral cancers from the local population and determine their preclinical sensitivity to small molecule inhibitors that target tumour dependencies on key signalling proteins required for survival and proliferation of tumour cells. Here, treatment mainly revolves around chemotherapy, though being an effective form of treatment, brings with it severe side effects. Since chemotherapy tends to kill all dividing cells in the body, it results in hair loss, skin damage, loss of bone marrow and much more.

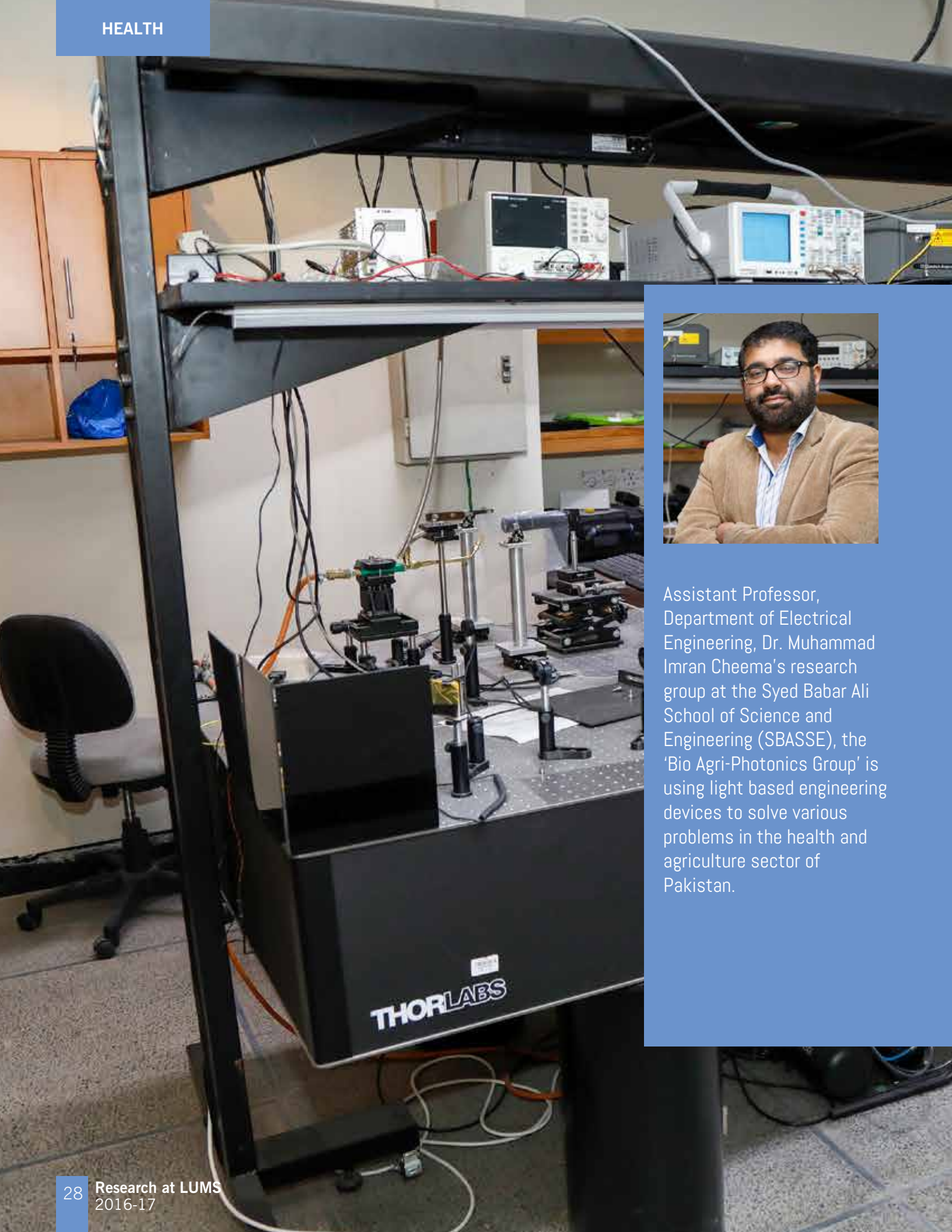
Presently, LUMS has one of the largest collection of cell lines in Pakistan and Dr. Faisal's venture, which is evaluating tumours and identifying mutations, will be a great stepping-stone in the treatment of oral cancer by growing tumour cells in a 3-D culture; mimicking the growth of a tumour to test medicines. This is done with the hope that, medicines can then be used effectively, knowing that a pre-clinical evaluation has determined their effectiveness against cancer cells.

Dr. Faisal's research aims to initiate personalised therapy

for the treatment of oral cancer. His research is targeted to identify the specific mutations in genes that cause oral cancer and then effectively use drugs against the proteins encoded by them. In this way, not only will the cancer-causing cells be eradicated, but also the normal cells will be saved from being exposed to harmful effects of chemotherapeutic drugs. The research takes cell lines (cells that are taken from individuals and cultivated in a controlled environment) of South Asian descent and tests them with 12 targeted drugs to identify which drugs are effective in counteracting cancer. They are also presently screening a library of more than 1,100 drugs on the cancer cell lines to find effective medicines, which can kill these cancers cells potently and effectively. The main purpose is to identify compounds that can potently kill cancer cells from the set of 12 drugs they are using.

In order to finance this research, Dr. Faisal has been successful in acquiring a grant of PKR 4.6 million from the Higher Education Commission (HEC).

This momentous undertaking is no doubt very time intensive. According to Dr. Faisal, the research will take three years and this is just the first year. The research started in June 2017 and is on course for achieving its objectives for the first year. If the findings from this study are validated in clinic in the next few years or a decade, this could have a drastic impact on the treatment of this disease in Pakistan and therefore, reduce the overall mortality associated with it.



Assistant Professor,
Department of Electrical
Engineering, Dr. Muhammad
Imran Cheema's research
group at the Syed Babar Ali
School of Science and
Engineering (SBASSE), the
'Bio Agri-Photonics Group' is
using light based engineering
devices to solve various
problems in the health and
agriculture sector of
Pakistan.

PHOTONICS SENSORS FOR DETECTING MILK CONTAMINATION

Milk is the basic component of diet as it provides vital nutrients to not only adults but importantly to kids too. Unfortunately, 80% of milk in Pakistan is contaminated with different ingredients. Adulteration of milk affects the quality of further dairy products. The contaminated milk and corresponding dairy products cause serious health problems including typhoid, diarrhea, gastroenteritis, brucellosis, allergies, stomach diseases, and cancer.

Currently, standard laboratory settings are required for reliable testing of milk samples thereby making it extremely challenging for end consumers to monitor the quality of milk. This suggests that common people need to have access to a rapid, accurate, portable (ideally handheld), and inexpensive sensor for checking the quality of milk they drink. The current project will be a stepping-stone towards achieving this long-term goal. If this goal is achieved, it will dramatically reduce the burden on the national health sector.

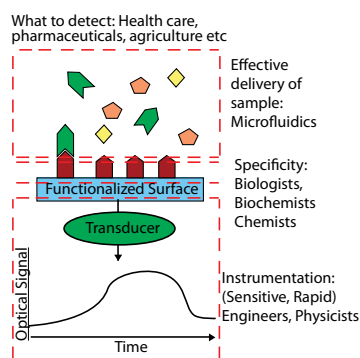


Figure 1

The term photonics is an optical analogue of electronics i.e., instead of electrons, photons are running in engineering systems. The last decade has seen tremendous progress in photonics systems in various fields including telecommunications, consumer electronics and sensing. Realising the potential of photonics, the United Nations declared 2015 as the International Year of Light and Light-based Technologies (IYL 2015). Among the variety of photonics systems, optical sensors are versatile and widely used in many applications.

An optical sensor is a device that uses light as a probe to detect and/or provide information about a specific event. Optical sensors find applications in numerous sectors, e.g., healthcare, pharmaceuticals, environmental monitoring, agriculture, and security. In these applications, the principle requirements are that the sensor should be

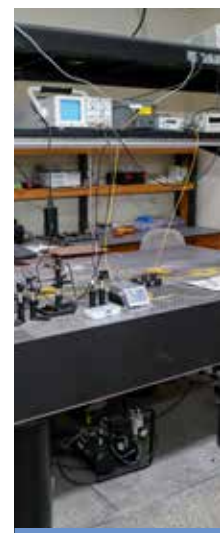
sensitive, real time, specific and inexpensive. Interdisciplinary approaches are required to fulfil all of these requirements. To motivate this, a conceptual diagram of the sensor is shown in Fig. 1, i.e., a team of engineers, physicists, biologists, chemists, biochemists, microfluidics experts, and professionals from a target application industry are required to make a successful sensor.

The potential of optical sensors is exciting because rapid research into photonics systems entails that the realm of possibility for their utilisation can be extended into the realm of safe drinking water and milk wherein contamination vectors can be readily identified.

"If you receive milk from a milkman, it is strife with various problems. Diluting milk with water is an old problem now, milkmen nowadays inject their livestock with antibiotics and hormones and usage of substandard feed is also common; consequently, the milk we drink contains a lot of hazardous chemicals. So just imagine, if we create a device through which the consumer can scan milk before drinking; the impact of this device would be enormous," explains Dr. Cheema.

Dr. Cheema is working on developing an optical sensor that will employ optical fibre cavities for detecting milk contamination. Optical cavities are an optical analogue of tuning forks. On energising a tuning fork, it vibrates at a particular "resonant frequency" and after a finite amount of "ring down" time the vibrations stop. Now if a mass is attached to the tuning fork, both the resonant frequency and ring down time change which can be correlated to the amount of mass attached i.e., the tuning fork acts as a mass sensor. In the fiber optical cavity sensor both the resonant frequency and the ring down time will be measured as a function of a milk contaminant. Technically, an optical cavity will be designed and built by using free space mirrors (Tuning Fork). A sample will be placed inside the cavity and laser pulses will be injected into the cavity (Energising). The change in output parameters (resonant frequency, ring down time) of the light are then measured and correlated with the contaminant (Sensing).

The current work is geared towards the agriculture sector and the long-term goal of the project is to develop a milk contamination device that is portable, cheap, and can easily be operated by non-specialists. Significantly, the project can be extended for developing portable solutions to other important problems including safe drinking water, monitoring the health of soil, crops, and fruits. This research work may lead towards an interdisciplinary and vibrant agriphotonics programme at LUMS.





Dr. Muhammad Tariq, Associate Professor at the Department of Biology, Syed Babar Ali School of Science and Engineering (SBASSE) is passionate about generating world-class researchers who are well-trained and self-driven about fundamental research and who will take up challenges of life sciences, agriculture and medicine in the country.

REVERSE GENETICS APPROACH TO LINK EPIGENETIC CELL MEMORY AND CELL SIGNALLING

Life starts with a single cell. You were once only a cell that multiplied and divided into similar copies. But now, as an adult, you are made up of trillions of cells, of different kinds. Ever wondered what makes cells, arising from the very same cell, different from each other? What determines the fate of cells? Which factors affect the different role of cells that have the same genetic make-up? What maintains the identity of different cell types existing in our body and what may be the consequences if cells lose their identity? These very questions are the topics of a very interesting research at the LUMS Epigenetics Lab – the first epigenetics lab in Pakistan – led by Dr. Muhammad Tariq, Associate Professor of Biology at Syed Babar Ali School of Science and Engineering, LUMS.

Dr. Tariq joined LUMS in 2009 when he came back to Pakistan and started building the Biology programme at LUMS. He put epigenetics at the heart of his research. Epigenetics deals with chemical changes on a level above DNA which are responsible for literally turning genes into Off or On states and they are responsible for our proper development as humans. Analogous to a tube light, when a gene is On, it is functional and when a gene is Off, it is non-functional. Where DNA is considered the basic genetic material we inherit from our parents, epigenetics encompasses all chemical modifications on DNA and molecules which wrap DNA and their consequences on gene expression (On or Off) which we inherit from our parents. To conduct a research on the molecular link between epigenetic cell memory and cell signalling during development and the epigenetic basis of diseases, Dr. Tariq chose *Drosophila* as a model system because molecular, biochemical and genetic tools available in fruit fly research are key to address fundamental questions in development.

"I am training my BS Biology students in conducting

cutting-edge research in epigenetic cell memory using the fruit fly system. Till now I have trained more than thirty senior students in various aspects of epigenetic cell memory. A very important milestone in this whole process was the senior project of Ms. Zain Umer (BS Biology 2012) who made the first DNA plasmid, also termed the GFP based reporter system. Dr. Saima Anwar, a former postdoctoral fellow at the department and Ms. Umer both worked extremely hard to ensure we have preliminary data to see if we may rely on our experimental approach and the reporter system which Ms. Umer constructed by engineering different molecules of fly DNA together with GFP. Ms. Umer's thesis gave us a much needed boost and was a turning point because then we just redesigned and improved the reporter system later for an efficient analysis," shared Dr. Tariq.

The focus of Dr. Tariq's research is how cell fates are determined, for example how identity of eye cells, liver, heart, kidney etc. are established and how they are maintained. In addition, can fates of cells be changed from one cell type to another? The research focuses on discovering the molecular link between epigenetic factors and cell signalling and the communication network existing in cells which ensures that cells remember their identity i.e. epigenetic cell memory throughout the life of an organism. Molecular and genetic analysis in fruit flies have discovered two groups of genes, namely the Polycomb group and Trithorax group genes, which act as silencers and anti-silencers, respectively.

The fundamental aim of this research is to discover novel genes which are involved in maintenance of cell fates and to notice the missing link of Polycomb and Trithorax group proteins with the cell signalling network.

Defects in epigenetic cell memory lead to cancer. Anything new discovered by this research will contribute to the knowledge of cancer and hence would help in identifying underlying factors causing cancer. But the scope of this research is far beyond that. The findings of this research may be relevant decades or centuries from now. A broader objective of this project is to generate world-class researchers who are self-driven and passionate about fundamental research and who will take up challenges of life sciences, agriculture and medicine in our country.



DISCOVERY AND DEVELOPMENT OF ANTI-DENGUE THERAPEUTICS BY TARGETING THE VIRUS-SPECIFIC PROTEASES



A prolific researcher and a passionate teacher, Dr. Muhammad Saeed, Associate Professor at the Department of Chemistry and Chemical Engineering, Syed Babar Ali School of Science and Engineering (SBASSE) is dedicated to eradicating the horrors of Dengue from this world. He has been tirelessly working for years on his project, details of which, he shared with us in an absorbing interview.



Dr. Muhammad Saeed, met us to explain in layman terms the background of his research on Dengue, what keeps him motivated, the complexity of the issue at hand, the stakes and the procedure. What is interesting is the fact that he uses fun terms metaphorically to make sure he conveys his knowledge to people of various levels of understanding.

Talking about what compelled him to begin this research, he spoke how the world witnessed an epidemic breakout in the 18th century, when about 2 to 4 countries were simultaneously affected by this horrifying disease, that we call Dengue. Since then, the menace of this ailment has been almost neutralised from the First World Countries, but the Third World Countries continue to be harassed by the sporadic outbreaks of the viral infection. He shared how disappointing it is to know that the World Health Organization (WHO) has kept it under the category of 'the ignored diseases,' probably because, it does not affect the powerful nations of the world. Dr. Saeed says that this is what motivated him to pursue research in the area.

Moving towards the details of his research, Dr. Saeed first chose to explain the complexities faced when dealing with a virus, especially with the Flaviviridae family viruses. We shared his enthusiasm of the subject when he explained to us how our immunity acts like police and viruses as intruders. He used analogy to convey that normally police limits/renders the activities of intruders; however, sometimes when the trespasser attacks the police base itself (the cells that maintain our immunity), it is the police that is rendered useless. Such is the ferocity of a viral infection. Paired with this infective agent's ability to modify its RNA every few years, it makes it very difficult for

researchers to develop a way so as to permanently remove it from the planet.

Answering questions about the nature of the prospective drug, Dr. Saeed informed us that it would cure people, after they have been attacked by the infectious condition. He shared why vaccinations have failed, in this case, throughout history. Dr. Saeed said, "Vaccinations need to contain all possible types of the said virus. If that doesn't happen, and another type of the virus, of the same family attacks a person, our own immunity fights itself, facilitating the purpose of the disease. The consequences are, as we witness today, scary. The affected person complains of severe headaches, rashes, vomiting and sometimes even suffers from hemorrhages."

When asked to shed some light on the procedure and course of his discovery, Dr. Saeed responded by saying that it is a process that takes years to achieve completion. He, however, has set the basic foundations for the research to build on, and soon his efforts would begin to yield fruitful results. He highlighted the several steps that he has yet followed and identified the disease specific target, studied its chemical environment and chemical compounds that could possibly inhibit the activity of the target. The latter, he continues to work on. Once it is achieved, he shared, he hopes on collaborating with a hospital, get further funding for his project, begin with his pre-clinical trials, move to clinical trials, and then hopefully launch his drug in the local market. During the course of the discussion, Dr. Saeed also debunked a popular myth about pre-clinical trials. Outlining the concerns people raise about such trials, i.e. why are animals tested for human ailments and how the results yielded for animals can be put in parallel to those for humans, he highlighted that the purpose of such a methodology is basically to check the drug for toxicity and side-effects merely. Applications in humans might result in the spread of an epidemic, which certainly nobody wishes to happen.

"Our assessment is that we will soon discover a 'lead' for the antiviral drug development. Successful completion of this research will provide new therapeutic agents that can save lives of millions of people in Pakistan and neighbouring countries," explained Dr. Saeed.





Dr. Abid Aman Burki, Professor of Economics and Dr. Ayaz Qureshi, Assistant Professor of Anthropology at the Mushtaq Ahmad Gurmani School of Humanities and Social Sciences through their research identified contributing factors for alarmingly high wasting rates among children under age five in Punjab. Based on their findings, appropriate interventions and policy actions were proposed for implementation by the Government of Punjab to achieve the global nutrition targets of reducing childhood wasting to less than five percent level.

CONTRIBUTING FACTORS RELATED TO ALARMINGLY HIGH WASTING RATES IN CERTAIN DISTRICTS OF PUNJAB, PAKISTAN

Wasting, or low weight for height, measures the current nutritional status of children under age five. This is a short-term measure that refers to acute under-nutrition caused by recent nutritional deficiency due to changes in the availability of food and/or infectious diseases such as diarrhoea. In Pakistan, the incidence of wasting and micronutrient deficiency is endemic. Globally, childhood wasting rates exceeding 5% are considered alarmingly high. However, in Pakistan, over the past forty years, the wasting rates in children under age five have consistently increased from 8.6% in 1977, 10.8% in 1985, and 14.3% in 2001 to 15.1% in 2011. The province of Punjab has a high prevalence of stunting and wasting with 34% of children under five being stunted and 18% wasted children in 2013-14. More particularly, the incidence of wasting and underweight is very high in central and southern districts of Punjab. This warrants immediate attention.

"The Government of the Punjab wanted to address the issue of malnutrition, but the factors that contribute to increased rate of wasting across districts are not clearly

understood because they are complex and range from child health and caring practices and proximate determinants to socioeconomic and demographic factors and environmental factors," explain Drs. Burki and Qureshi.

Their study, "Contributing Factors Related to Alarmingly High Wasting Rates in Certain Districts of Punjab, Pakistan" commissioned by the Health Department, Government of Punjab with funding from UNICEF Pakistan, took to find out the risk factors for high childhood wasting so that adequate interventions and policy actions could be proposed to address the issue. The final aim was to achieve the global nutrition targets of reducing childhood wasting to less than 5% level.

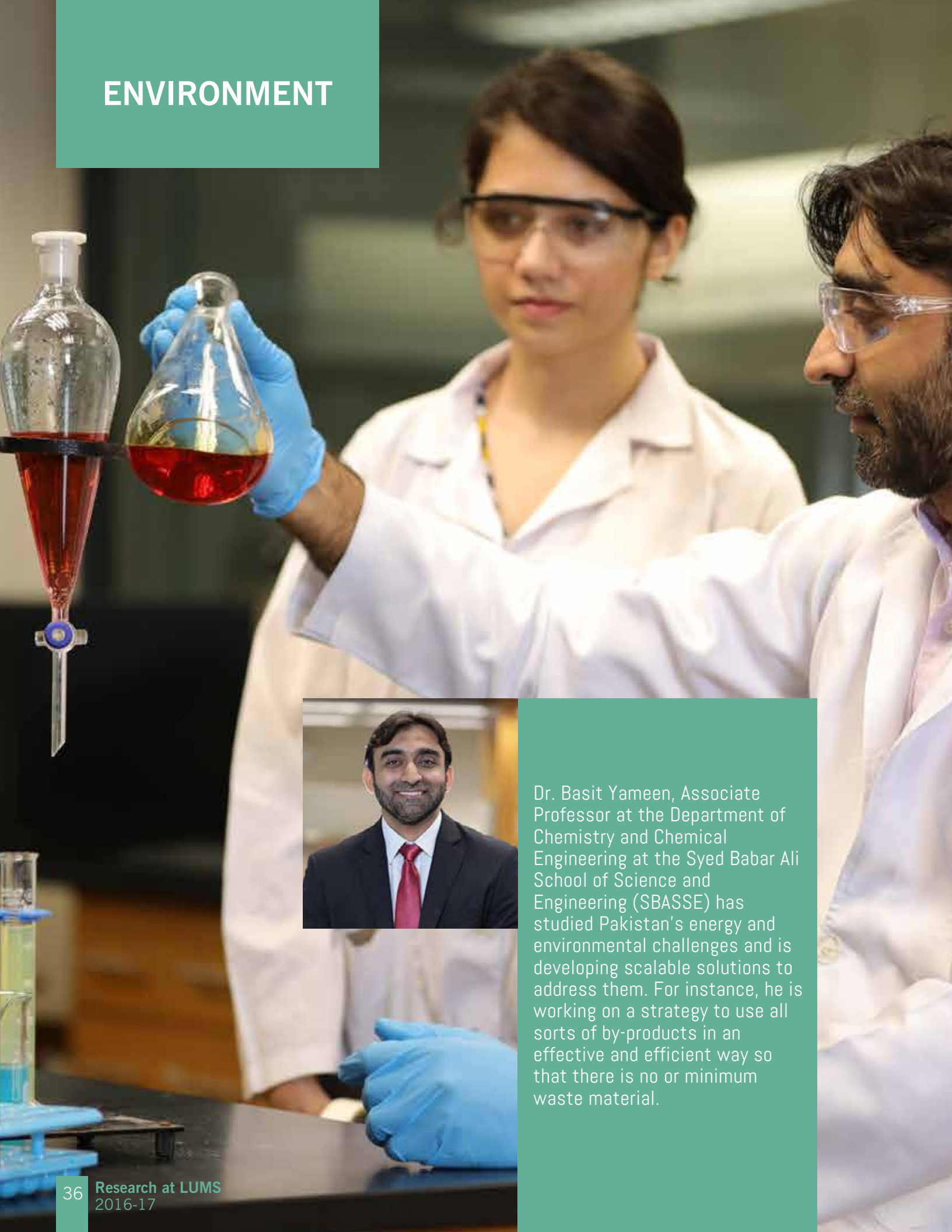
With this aim in mind, they employed a mix-methods approach, where a rigorous quantitative analysis is complemented with an equally rigorous qualitative data collection through focus group discussions and in-depth interviews. Child level data was extracted from MICS 2014 to examine the influence of various risk factors for wasting in children under five.

In this particular research, wasting was measured by weight-for-height Z-score of two standard deviations below the median (-2SD); severe wasting was measured by -3SD below the median based on growth standards for children under the ages of five published by the World Health Organization.

"The insights provided by this study can be used to formulate and implement targeted interventions more successfully. The multi-faceted nature of child wasting in Punjab offers useful entry points for policy interventions. However, success may not come through simply by focusing on one or two of these determinants. The impact of any such intervention would be influenced by the combined effects of all the key groups of determinants within the system," say Drs. Burki and Qureshi.



ENVIRONMENT



Dr. Basit Yameen, Associate Professor at the Department of Chemistry and Chemical Engineering at the Syed Babar Ali School of Science and Engineering (SBASSE) has studied Pakistan's energy and environmental challenges and is developing scalable solutions to address them. For instance, he is working on a strategy to use all sorts of by-products in an effective and efficient way so that there is no or minimum waste material.

TRANSFORMING BIOMASS ASH RESIDUES INTO COMMERCIALIZABLE PRODUCTS

Based on his background in chemical sciences, Dr. Basit Yameen's stream of research is focused on addressing real-life challenges having a direct impact on our society.

One such project Dr. Yameen has currently undertaken along with fellow colleagues, Dr. Falak Sher and Dr. Habib ur Rehman, is a collaborative venture with Bulleh Shah Packaging.

Pakistan has a finite supply of natural resources that can be used to power our industry. Due to this, some industrialists are looking for alternative sources of energy that are not only self-sustainable but renewable as well. To that end, many have opted for alternate fuels for indigenous thermal power generation.

One such fuel is coal. However, burning coal does bring with it many environmental problems. For instance, it results in the emission of sulphur dioxide, nitrogen oxide, particulate matter and toxic heavy metals into the troposphere (lower atmosphere) which leads to smog, acid rains, toxins in the environment, and numerous respiratory, cardiovascular, and cerebrovascular defects. Furthermore, coal is not a renewable resource. Besides this, the ash generated during coal burning contains high levels of toxic metals that pollute our environment and constitute a huge health concern. Due to this, many industrialists are primarily opting for agricultural residues based fuel sources.

Since Pakistan is an agricultural country and produces surplus agricultural residues, these can be used as renewable 'fuel' for thermal power generation. When farmers harvest crops the only by-product left from that exercise are the stems. According to Dr. Yameen these are an abundant renewable source of energy which are not being properly utilised as fuel for thermal power stations. However, the ash produced during burning of agricultural residues (biomass) although does not contain toxic contents as compared to the ash produced during

coal burning, it still needs to be taken care of and somehow fixed. Otherwise, it becomes a burden on our environment.

To power their facility, Bulleh Shah Packaging relies on its biomass-based thermal power station and is not dependant on the national grid. The process powers the entire facility and thus it consumes large amounts of biomass which consequently results in the generation of large amounts of ash residues. Maintaining and disposing of the ash is a huge challenge and a cost-intensive endeavour. Dr. Yameen proposes to use that ash to manufacture products that can be used elsewhere; for instance, using the ash to make pavers.

The project has been partially funded by the Higher Education Commission (HEC) through their Technology Development Fund (TDF) since June 2017. Prior to this involvement, Dr. Yameen and Bulleh Shah Packaging had been working on the project for a year; Bulleh Shah Packaging provided the entire support and continues to co-fund the whole activity.

At present, although the HEC is funding the project, the funds are limited and will eventually run out. For this Dr. Yameen, along with Bulleh Shah Packaging have devised a complete business model to generate revenue. Alongside this, they are also in touch with people in the market who have been given samples of the bio-pavers and are ready to buy these in bulk, making this a self-reliant and economically sustainable endeavour.

Dr. Yameen and his team are also developing a bio-paver fabricating plant, which will turn the ash into the said pavers and will be installed on a site owned by Bulleh Shah Packaging. He is expecting to launch this product into the market by mid-2018.

The whole process is economically viable and will generate revenue and save millions of rupees for the industrial sector.

The end goal of this research is to not only save industry costs but also find sustainable solutions to Pakistan's environmental and energy challenges and turn by-products, which can be an environmental burden, into revenue generating valuable products.





Dr. Ayesha Ali, Assistant Professor at the Department of Economics, Mushtaq Ahmad Gurmani School of Humanities and Social Sciences (MGSHSS) through her research has been exploring how we can address the energy scarcity challenge in developing countries such as Pakistan. Her research examines the impact of electricity outages on household welfare and the role of new technologies in improving energy efficiency.

ADDRESSING THE ENERGY SCARCITY CHALLENGE IN DEVELOPING COUNTRIES

One of the most significant public policy challenges for growing economies such as Pakistan is how to ensure access to clean and affordable energy in a sustainable manner. We are all familiar with the experience of “load-shedding” in our everyday lives at home, in the workplace and in the marketplace. As an economist who is interested in understanding choices and behaviour of different actors in the economy using theory and empirical data, the goal of Dr. Ali’s research is to inform public policies that can address the energy scarcity challenge from both the demand and supply perspective.

In her research, she has developed a novel way to use big data to learn about the incidence of electricity outages in Pakistan. Specifically, she used the brightness in night time lights and their variability as observed in satellite images to construct an annual measure of the severity of outages across districts over the period of 2006 to 2012 which coincides with the peak of the electricity shortage crisis in Pakistan.

In the absence of reliable and consistent data on outages at the subnational level, this approach provides a valuable way of learning about the impact of outages on economic activity. Using national household survey data together with this measure of outages, Dr. Ali found that at the peak of the electricity shortage crisis, an additional hour of outages each day reduce household income by 18%, employment by 2%, and labour productivity by 11%.

“The effect is largest in the most developed parts of the country which are the biggest users of electricity and therefore suffer the most when deprived of this vital resource,” further explains Dr. Ali. Looking at household electricity consumption behaviour in response to outages, she also found that high income households reduce their grid electricity consumption less than the low income households. This suggests that they reschedule their electricity using activities, acquire storage batteries, or adapt in other ways to mitigate the effect of power cuts, since they have a high value for electricity.

Dr. Ali’s research findings have direct implications for policymakers engaged in managing energy shortages. Firstly, her findings imply that in order to minimise the economic losses from outages, electricity should be allocated to those areas that have the highest unserved demand. In this way, economic losses that would arise when these areas are

deprived of electricity can be minimised. Secondly, her findings also suggest that untargeted subsidies that lower the price of electricity for all groups without consideration of the value they place on the electricity are inefficient and wasteful. Therefore, policymakers should remove untargeted energy subsidies and compensate low income households through other support mechanisms.

Apart from understanding the impact of energy shortages, in a parallel research, Dr. Ali also examined the effectiveness of new technologies in improving energy efficiency. “Finding ways to improve efficient use of energy is a win-win solution in addressing the energy scarcity challenge, as it enables us to create more value from the same unit of consumption.”

This particular research has been undertaken together with colleagues from the departments of computer science and electrical engineering. The specific application of energy efficiency that is examined is building level temperature control. Most of the existing buildings in emerging economies are not equipped with centralised temperature control systems which results in excessive energy consumption.

As an economist, Dr. Ali’s aim is to quantify the potential energy savings that can be realised by deploying an integrated resource management system to overcome this problem. Her findings show that with just 20% market penetration of this new technology, at least 6% of electricity per capita can be saved in residential and commercial sectors in a developing country such as Pakistan.

Dr. Ali hopes that the findings of her research will be able to form policies to manage energy shortages and shed light on viable solutions to address the energy scarcity challenge in developing countries.



PROBLEMATIZING CITIZENSHIP IN A POSTCOLONIAL NATION-STATE: A CASE STUDY OF PAKISTAN



Dr. Ali Usman Qasmi, Associate Professor at the Department of Humanities and Social Sciences, Mushtaq Ahmad Gurmani School of Humanities and Social Sciences (MGSHSS) took on an academic study that delved deep into the idea of citizenship in postcolonial states, with a special focus on Pakistan. Exploring the dynamics and strategies of state formation, identity articulation and national integration in postcolonial settings, the project not only traced the trajectory of a complex history of citizenship in the Western context with various factors impinging upon it, but also served as a corrective for its conceptual basis.

As the fact stands, a lot of work has been done on the idea of India, the kind of Indian republic that was being imagined and the contributions made by leading ideologues or political figures shaping the outcome of the Indian republic in the form of its constitution and the democratic set-up in 1949-50. Opposed to this considerable work regarding India, the idea of the Republic of Pakistan, to date, has not been explored. Moreover, Dr. Qasmi says, "It is presumed that whatever the ideological content of the new state was summed up in the Objectives Resolution of 1949, it eventually shaped the outcome of political processes and constitution making. I wanted to go beyond that and look at the way in which the issues were being debated, especially during the first decade of Pakistan's existence from 1947-56."

The exploration of the idea of citizenship in Pakistan and the processes of idea formation from 1947 onwards was thus direly needed. This research is a spin-off of Dr. Qasmi's previous works, namely one that came out recently, in an edited volume called, 'Muslims against the Muslim League: Critiques of the Idea of Pakistan'. In this particular research, Dr. Qasmi looked at what the Muslim community has gone through and the various transformations that occurred in the late 19th century and the gradual unfolding of the idea of a Muslim *qaum*. "This got me thinking that there exists a kind of pre-history of the idea of Pakistan, the history of a Muslim *qaum* that was transformed in a postcolonial context," explains Dr. Qasmi.

Broadly speaking, Dr. Qasmi did not pursue any fixed timeline, and did tend to travel back and forth with only two major cut-offs. The first was 1956, when the first constitution got approved and the debate about the ideological content of the new state of Pakistan was much settled. Meanwhile, the second is from 1971-74 because by 1974, the constitution had been approved and the controversy about recognising the new state of Bangladesh had also been settled. Hence, a new kind of imagination in Pakistan was happening. Nonetheless, much of the debates that happened in 1950's continued to have an impact or shape these debates later on in 1970's as well.



In his research, Dr. Qasmi looks into various issues. "I mainly studied constitutional and ideological issues. These include, the features of Pakistan's polity, nature of Pakistan's constitution, the question of what defines Pakistan as a postcolonial state as it emerged," explains Dr. Qasmi. He takes into account various examples, even if they may appear to be quite trivial in nature. The issue of which national holidays should be observed in this new republic is a prime example. Unlike British India, where all different religious denominations were covered, the new state of Pakistan had to make a decision about which kind of religious and other kinds of occasions should be celebrated. Thus, the idea of a national calendar as it emerges and the centrality of such occasions like Eid, Muharram, Eid Milad-Un-Nabi and all of that excluding 'minority festivals' such as Navroz, Easter, Holi and others which continued to be observed till 1950's were observed. Gradually a new kind of national calendar was emerging.

Similarly, a new kind of idea of education also emerged. This referred to what kind of history has to be taught or what was going to be the narrative which dominates official textbooks or the departure from history textbooks which were being taught prior to 1947. Dr. Qasmi's work also looks into the debate on the idea of national history, citizenship, culture, the scope of how we approach and address the limits of Pakistan's culture or civilizational limits so that it is going to be limited to the present day frontiers of Pakistan or does it go beyond that? "If it doesn't go beyond the present day limits of Pakistan, so what about Taj Mahal, or what about Ghalib or the people who lived before 1947, pre-partition," elaborates Dr. Qasmi.

"These questions were at the heart of different debates which were taking place in Pakistan within the constituent assembly and beyond in the larger public sphere in newspapers and magazines as well as in various other

interactions that were taking place," says Dr. Qasmi.

For his research, he extensively travelled to explore archives in Lahore, Karachi, Islamabad and Dhaka. Looking at government and private records, newspapers and private papers, he developed an overall picture of the actors involved and the variety of debates that took place. He published his findings on the idea of a national calendar in *Nations and Nationalism*. Meanwhile, his article on the idea of 'national history' of Pakistan has been approved for publication in *Modern Asian Studies*. It shows how a transition was made from the 'pre-history' of the idea of Pakistan in the 1930's and 40's to the ways in which a 'national history' finally emerged in the 1960's that was replicated for statist purposes in textbooks.

In the larger Pakistani context, Dr. Qasmi's work tries to decentre the kind of statist hegemony that has existed in writing about themes highlighted above. Deconstructing this hegemony opens up the possibility of alternative approaches to histories and the possibilities of writing history from the margins. The idea is not to write history from a Pakistan centric approach but from a much broader conceptual basis spanning postcolonial societies, especially Muslim societies that have similarly engaged with the complexity of the question of modern state making. Such an enquiry into the theme of citizenship carries much relevance for current questions of legal and social inequality and democratic development in the Muslim majority countries across various regions.





Dr. Maryam Wasif Khan is Assistant Professor of English and Comparative Literature at the Department of Humanities and Social Sciences at the Mushtaq Ahmad Gurmani School of Humanities and Social Sciences (MGSHSS). Dr. Khan's research revolves around the discourse and practice of orientalism in eighteenth-century Europe and its transformative influences in the colony and present-day postcolonial states such as India and Pakistan. Her current book manuscript, tentatively titled *Marauders and Martyrs: Orientalism and Vernacular Populisms* argues against a scholarly investment in a global Anglophone literature, advocating instead a sombre re-examination of the vernacular literary and popular forms that have remained instrumental in the formation of the nationalist imaginaries of the post-colony. The project traces the rise of present-day populism in Pakistan to the heyday of Orientalist activity in eighteenth-century England and the early colonial city of Calcutta.

تاریخ پاکستان
(یکجا)

نمرہ احمد



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MARAUDERS AND MARTYRS: ORIENTALISM AND VERNACULAR POPULISMS

Dr. Maryam Wasif Khan is trained in Comparative Literature and thus her work is often anti-nationalists in its thrust, working across boundaries, refusing to see national literatures as self-contained or total categories. While she specialises in eighteenth-century English and French literature, she reads these works in terms of their influence *outside* the European Republic of Letters. In particular, she looks at how certain powerful images of Muslims and Islam in the eighteenth-century oriental tale travel into the Indian colony and become integral parts of an emerging national identity in Urdu. Opting to organise literary texts in certain historical orders, she works with texts that she sees as continuous with one another: these could include canonical literary texts such as the *Arabian Nights Entertainments* or the early Urdu *Bagh-o Bahar*, colonial school syllabi, pamphlets, and popular women's romance novels.

Dr. Khan has published parts of her project in leading literature journals, including *PMLA* and *Modern Language Quarterly: A Journal of Literary History (MLQ)*. She has also presented portions of this work at prestigious conferences such as the MLA convention and the bi-annual Society of Novel Studies conference. The earliest draft of her current project was her doctoral dissertation, supervised by Professor Aamir Mufti, in the department of Comparative Literature at UCLA. At the heart of this project and its earlier forms is the idea of *method*, in this case, inspired by the powerfully humanist ideas of the late Edward Said, one of the great public intellectuals, academics, and critics of our times. In other words, Dr. Khan reads literary texts as both historical and aesthetic events, a critical method that forces to the forefront the hegemonies and institutions behind the making of modern Urdu literature.

One of the most productive spaces for Dr. Khan's research has been the classroom itself.

"I not only teach courses on things I want to know more about, but also use the classroom to develop a method," she says. "I try to teach my students about the historical

circumstances that give way to such texts, about the particular resistances or hegemonies that these texts may participate in, and how to close read texts in such a way that they become relevant in the present."

Whether it is pairing staidly-established authors like Jane Austen with Urdu television dramas to make students understand how domestic constructs about women become a part of our daily imaginations, or using an epic like the *Iliad* to help students to see the violence that surrounds them living in a country like Pakistan, Dr. Khan sees the classroom as a place of discovery, both for herself and her students.

She has worked through several of the arguments central to the current book manuscript in advanced seminars such as ENGL 4511: Orientalism, ENGL 2516 Domesticity and Dominance, as well as in an interdisciplinary team-taught course called, SS 119: In Our Times: Home, Identity, and Belonging.

The impact of a person working in the fields of Literature and History is potentially huge, and has historically been such. The work of humanists such as Dr. Khan is critical in making people rethink their approach towards questions of identity, their attitudes towards gender, and their relationships with the state, just to give a few examples.

Through her book project, Dr. Khan hopes to illustrate how our present moment - rife with state-sponsored fascism - has its cultural roots in orientalist conceptions about Muslims and their place in North India. She hopes her work will force us to re-examine our intertwined religio-cultural past from around as far back as 1800, when an institution called Fort William College was setup in Calcutta. "Our work is just beginning," Dr. Khan says, "and is perhaps the only way Pakistan can be saved from itself: if we don't understand our histories outside and against the nationalist narratives imposed upon us, we will lose what little we have entirely. In this dark moment, our work is urgent and needs support, both moral and institutional."



INTERNALLY FUNDED GRANTS

LUMS FACULTY INITIATIVE FUND (FIF)

2016-17	Submitted	Approved	Funds Requested (PKR)	Approved Funds (PKR)
FIF	80	41	71,080,730	38,077,480

Adnan Khan, SBASSE, Use of Isolation and Multi Vaccination for Control of Influenza

Ahmad Kamal Nasir, SBASSE, Development of a Long Endurance Hybrid UAV for Agricultural and Forestry Applications

Ahmed Jawaad Afzal, SBASSE, Understanding Elicitor Specificity of RPM1 and RPS2 by the Generation of Protein Chimeras

Ali Khan, MGSHSS, Cricket in the Age of Late Capitalism: An Inter-disciplinary Perspective from the Social Sciences

Ali Raza, MGSHSS, LUMS Digital Library: Digitizing Partition Testimonies

Ali Usman Qasmi, MGSHSS, Rhetoric and Politics: The Life and Ideas of Sayyid Ata Ullah Shah Bukhari (1892-1961)

Amir Faisal, SBASSE, Discovery and Characterization of In-house Microtubule Targeting Compounds as Potent Anti-cancer Agents that Can Overcome Multidrug Resistance

Anushay Malik, MGSHSS, The Many Stories of Youhanabad's Christian Minorities

Aziz Mithani, SBASSE, Genome-wide Identification of Salt Tolerant Genes in Bread Wheat Using High-throughput Sequencing Data

Bushra Naqvi, SDSB, Socio-cultural Norms Influence on Women Entrepreneurship

Choudhry Tanveer Shehzad, SDSB, Penny Wise, Pound Foolish? Capital Budgeting Decisions in Listed Companies on Pakistan Stock Exchange (PSX)

Ghayoor Abbas Chotana, SBASSE, Iridium Catalyzed Borylation Using Bis[(+)-pinanediolato] Diboron: Synthesis of Chiral Arylboronic Esters by C-H Borylation

Hamid Abdul Basit, SBASSE, Research and Development of a Design Patterns Based Code Recommendation System

Hassan Abbas Khan, SBASSE, Solar Photovoltaic Integrated Hybrid Distribution Architecture for Next Generation Buildings

Husnain Fateh Ahmed, MGSHSS, Slices of Self – Identity

and Context

Ihsan Ayyub Qazi, SBASSE, A Service Differentiation Framework for Next-Generation WiFi Networks

Ijaz Haider Naqvi, SBASSE, Validation and Testing of Next Generation MIMO Radar Systems

ImdadUllah Khan, SBASSE, A Course Enrolment Recommendation System: A First Phase in Educational Data Mining for Efficient Universities Decision Support System

Imtiaz ul Haq, MGSHSS, Preferences for Islamic Mutual Funds: The Role of Altruism, Religiosity, and Risk Preferences

Junaid Haroon Siddiqui, SBASSE, Making IT Systems Resilient Using Automated Program Analysis

Muhammad Azeem, SAHSOL, Labour Law Jurisprudence in Pakistan: A Critical Perspective

Muhammad Fareed Zaffar, SBASSE, Computational Modeling of Active Tuberculosis Using Clinical, Immunological Data

Muhammad Hamad Alizai, SBASSE, Old is Gold: Synthesizing Energy Efficient Use of Legacy Devices for Thermal Comfort in Older Buildings

Muhammad Imran Cheema, SBASSE, Towards a Real Time TB Optical Biosensor Based Upon a Combination of Raman and Cavity Ring Down Spectroscopy

Muhammad Sabieh Anwar, SBASSE, Establishment of Quantum Computing and Quantum Communication (QCQC) Laboratory at LUMS

Muhammad Saeed, SBASSE, Development of an Affinity Support to Facilitate Isolation and Structural Characterization of Native Human Thymidylate Synthase for the Posttranslational Modifications and their Role in Drug Resistance

Muhammad Shehryar Shahid, SDSB, Explaining Informal Domestic Work Practices in Pakistan through a Post-structuralist Lens: An Empirical Analysis

Muhammad Tahir, SBASSE, Acoustically Green Zones: Design and Development of an Active Sound Control System for Acoustic Noise Reduction in Both Open and Closed Spaces

Muhammad Zaheer, SBASSE, The Development of a Glycerol Fuel Cell for the Production of Electricity from Biodiesel Waste

Nadeem Ahmad Khan, SBASSE, Adaptive Intelligent Epilepsy Management System

Naeem Ashraf, SDSB, (De) Institutionalization of Carbon Offset Market

Nauman Zafar Butt, SBASSE, Graphene Based Microfluidic Biosensors for Early Detection of Breast Cancer

Naveed Arshad, SBASSE, Towards Developing a Smart Electric Grid in Pakistan with 100% Renewable Energy Sources

Naveed UI Hassan, SBASSE, Towards Energy Efficient Commercial Buildings through Consumer Behavior Considerations Using Internet of Things (IoT) and Machine-to-Machine (M2M) Platforms

Rashid Memon, MGSHSS, Stereotype Bias, Discrimination, and Performance

Salman Nosheer Arshad, SBASSE, Higher Capacity Lithium Ion Batteries Using Silicon/Carbon Composite Nanofiber Anodes

Shaper Mirza, SBASSE, Hyperglycemia Mediated Dysregulation of Macrophage Activation and Polarization in Type 2-Diabetes

Suleman Shahid, SBASSE, Designing Digital Aids for Children with Autism in Pakistan

Syed Shahzad UI Hussan, SBASSE, Establishment of Protocols to Discover New Dengue Virus Inhibitors from Natural Sources

Tania Saeed, MGSHSS, Higher Education and the Neo Liberal Economy: Examining Education Quality and the University Ranking Framework in Pakistan

Zubair Abbasi, SAHSOL, The Role of Judiciary in Protection of Women's Rights: A Case Study of Divorce Law (Khula')

LUMS FACULTY TRAVEL GRANTS (FTG)

2016-17	Submitted	Approved	Funds Requested (PKR)	Approved Funds (PKR)
FTG	111	92	36,834,307	28,497,054

Abubakr Muhammad, SBASSE, Thinking Machines in the Physical World, Australia

Adnan Khan, SBASSE, Annual Meeting of the Society for Mathematical Biology 2017, USA

Ahmad Kamal Nasir, SBASSE, IFAC Conference on Sensing, Control and Automation Technologies for Agriculture, USA

Ahmed Jawaad Afzal, SBASSE, Plant Genomics Congress, USA

Ali Raza, MGSHSS, Annual Conference on South Asia, USA

Amber Riaz, MGSHSS, 91st Joint Session of the Aristotelian Society, UK

Amen Jaffer, MGSHSS, Annual Meeting of the American Sociological Association, Canada

Amir Faisal, SBASSE, EACR-AACR-SIC Special Conference 2017: The Challenges of Optimising Immuno and Targeted Therapies, Italy

Anushay Malik, MGSHSS, European Conference on South Asian Studies, Poland

The 77th Annual Meeting of the Academy of Management, USA

Anwar Khurshid, SDSB, Annual Conference of the North American Case Research Association (NACRA), USA

Asim Karim, SBASSE, Conference on Empirical Methods in Natural Language Processing (EMNLP 2017), Denmark

Atif Saeed Chaudry, SDSB, Annual Conference of the North American Case Research Association (NACRA), USA

Islamic Finance, Banking & Business Ethics Global Conference 2017, Malaysia

Ayesha Bhatti, SDSB, Islamic Finance, Banking & Business Ethics Global Conference 2017, Malaysia

Babar Ahmed Qureshi, SBASSE, International Conference on Supersymmetry and Unification of Fundamental Interactions, Australia

Basit Yameen, SBASSE, 2nd Green and Sustainable Chemistry Conference 2017, Germany

Choudhry Tanveer Shehzad, SDSB, Annual Conference of

- the North American Case Research Association (NACRA), USA
 Fahad Mehmood, SDSB, Smart Data 2017: The 3rd IEEE International Conference on Smart Data, UK
 Fahd Rehman, SDSB, 44th History of Economic Society Conference, Canada
 Faiza Ali, SDSB, European Academy of Management, UK
 Ghazal Mir Zulfiqar, SDSB, The 77th Annual Meeting of the Academy of Management, USA
 Hamid Abdul Basit, SBASSE, Asia-Pacific Software Engineering Conference, USA
 International Workshop on Software Clones, Australia
 Hassan Abbas Khan, SBASSE, 12th IEEE PES PowerTech Conference, UK
 IET Renewable Power Generation, New Zealand
 Hassan Haider Karrar, MGSHSS, Association for Asian Studies Annual Meeting, Canada
 Central Eurasian Studies Society Annual Conference, USA
 Hassan Javid, MGSHSS, European Conference on South Asian Studies, UK
 Ihsan Ayyub Qazi, SBASSE, 12th International Conference on Emerging Networking Experiments and Technologies, USA
 Internet Measurement Conference (IMC), Poland
 Ijaz Haider Naqvi, SBASSE, IEEE Vehicular Technology Conference, USA
 ImdadUllah Khan, SBASSE, 14th Australian Data Mining Conference, Australia
 The 9th International Workshop on Hot Topics in Planet, USA
 The Pacific Asia Conference on Information Systems (PACIS2017), Malaysia
 Imran Naeem, SBASSE, AMACS International Conference on Nonlinear Evolution Equations and Wave Phenomena: Computation and Theory, USA
 Irfan Ahmad Qureshi, MGSHSS, 15th International Convention of the East Asian Economics Association, Indonesia
 21st International Conference on Macroeconomic Analysis and International Finance, Greece
 Irshad Hussain, SBASSE, International Science and Technology Conference, Turkey
 Jawad Syed, SDSB, European Academy of Management, UK
 Junaid Haroon Siddiqui, SBASSE, 10th IEEE International Conference on Software Testing, Verification and Validation (ICST 2017), Japan
 Kamran Ali Chatha, SDSB, European Operations Management Association 2017, UK
 Kashif Zaheer Malik, MGSHSS, 86th Annual Meeting of Southern Economics Association, USA
 Research Collaboration with University of Oxford, Canada
 Khawaja Zain ul Abdin, SDSB, International Conference of Communication and Media, UK
 Mian Muhammad Awais, SBASSE, ACM Symposium on Applied Computing – Cyber-Physical Track, Morocco
 Momin Ayub Uppal, SBASSE, IEEE Vehicular Technology Conference, USA
 Muhammad Abdur Rahman Malik, SDSB, Annual Conference of the North American Case Research Association (NACRA), USA
 Eastern Academy of Management International, USA
 European Conference on Personality, Canada
 Muhammad Adeel Ahmed Pasha, SBASSE, Conference on Design & Architectures for Signal & Image Processing, Romania
 The 54th ACM/IEEE Design Automation Conference (DAC 2017), USA
 Muhammad Ghufuran Ahmad, SDSB, Annual Conference of the North American Case Research Association (NACRA), France
 The 77th Annual Meeting of the Academy of Management, USA
 Muhammad Hamad Alizai, SBASSE, 14th ACM International Conference on Embedded Networked Sensor Systems, USA
 Muhammad Shakeel Sadiq Jajja, SDSB, Australian and New Zealand Academy of Management Conference, Australia
 European Operations Management Association 2017, UK
 Muhammad Tahir, SBASSE, European Signal Processing Conference, Hungary
 Muhammad Tariq, SBASSE, EMBL Conference on Transcription and Chromatin, Germany
 Murtaza Taj, SBASSE, Computer Graphics International, Greece
 Mushtaq A. Khan, MGSHSS, Asia-Pacific Productivity Conference, China
 Nadhra Shahbaz Naeem Khan, MGSHSS, Ernst Herzfeld Society for Studies in Islamic Art and Archaeology - Reassessing Nineteenth-Century Art in Islamic Countries, Austria
 Punjab: Past, Present and Future (Punjab Research Group Conference), UK
 Nauman Ahmad Zaffar, SBASSE, The 32nd Annual IEEE Applied Power Electronics Conference & Exposition (APEC 2017), USA

Naveed Arshad, SBASSE, International Conference on Sustainability in Energy and Buildings 2017, Greece
Sustainability and Energy in Buildings, Italy

Naveed UI Hassan, SBASSE, IEEE International Conference on Communications (IEEE ICC 2017), France

Nida Yasmeen Kirmani, MGSHSS, Resistance: Between Theories and the Field, Belgium
The Informal and the Formal in Times of Crisis: Ethnographic Insights, Greece

Rasul Bakhsh Rais, MGSHSS, World Political Science Congress, Poland

Saad Azmat, SDSB, Islamic Finance, Banking & Business Ethics Global Conference 2017, Malaysia

Sadaf Ahmad, MGSHSS, European Association of Social Anthropologists Biennial Conference, Italy

Safee Ullah Chaudhary, SBASSE, 16th Human Proteome Organization World Congress, Ireland

Salman Khan, SDSB, Islamic Finance, Banking & Business Ethics Global Conference 2017, Malaysia

Sanval Nasim, MGSHSS, Association of Environmental and Resource Economists - Annual Summer Conference, USA

Syed Aun Raza Rizvi, SDSB, 2nd Applied Financial Modelling Conference, Australia
Islamic Finance, Banking & Business Ethics Global Conference 2017, Malaysia

Syed Muhammad Hussain, MGSHSS, Annual Conference of the Canadian Economics Association, Canada
Asia-Pacific Productivity Conference, China
China Meeting of the Econometric Society, China
Fall 2016 Midwest Macroeconomics Meeting, USA

Syed Shahzad UI Hussan, SBASSE, Carbohydrate Gordon Research Conference, USA

Tania Saeed, MGSHSS, Comparative and International Education Society (CIES), Problematizing (In)Equality: The Promise of Comparative and International Education, USA

Wala Salem Mustafa Saadeh, SBASSE, International Conference on Biomedical and Health Informatics, USA

Waqar Zaidi, MGSHSS, 25th International Congress of History of Science and Technology, Brazil

Wasif Tanveer Khan, SBASSE, European Conference on Antennas and Propagation, France

Zaghum Umar, SDSB, 29th Asian Finance Association Annual Meeting, South Korea
Annual Conference of the Multinational Finance Society, Romania
International Conference on Business and Economics Research, Canada

Zainab Riaz, SDSB, PICMET '17 Conference: Technology Management for the Interconnected World, USA

Zehra Waheed, SDSB, Passive Low Energy Architecture (PLEA), UK

Zubair Khalid, SBASSE, The 42nd IEEE International Conference on Acoustics, Speech and Signal Processing, USA

LUMS FACULTY STARTUP GRANTS (STG)

2016-17	Submitted	Approved	Funds Requested (PKR)	Approved Funds (PKR)
STG	23	23	29,720,000	29,720,000

Ata Ulhaq, SBASSE

Ayesha Ali, MGSHSS

Basit Yameen, SBASSE

Fahad Mehmood, SDSB

Faiza Ali, SDSB

Irfan Ahmad Qureshi, MGSHSS

Jawad Syed, SDSB

Kaveri Qureshi, MGSHSS

Maryam Wasif Khan, MGSHSS

Muhammad Ahsan, SBASSE

Muhammad Awais Bin Altaf, SBASSE

Muhammad Shafique, SDSB

Muhammad Usman, SBASSE

Omair Haroon, SDSB

Saher Asad, MGSHSS

Sanval Nasim, MGSHSS

Suleman Shahid, SBASSE

Syed Aun Raza Rizvi, SDSB

Tania Saeed, MGSHSS

Wala Salem Mustafa Saadeh, SBASSE

Yasir Mehmood, SBASSE

Zainab Riaz, SDSB

Zehra Waheed, SDSB

EXTERNALLY FUNDED GRANTS

SPONSORED RESEARCH GRANTS (SRG)

2016-17	Submitted	Funds Requested (PKR)
SRG	62	2,676,789,401

2016-17	Approved	Approved Funds (PKR)
SRG	58	380,843,671

[Abid Aman Burki, MGS SHSS](#), Rapid Assessment/Research for Identification of Contributing Factors Related to Alarming High Wasting Rates in Certain Districts of Punjab to Update and Improve the Existing Pakistan OOSC Study 2013 based on 2007-08 Data with New 2014-15 Data, following the Conceptual Methodological Framework (CMF) of the Global Initiative on OOSC

[Abubakr Muhammad, SBASSE](#), DyMASH (Dynamic Mapping and Sampling for High Resolution Hydrology)

[Adam Zaman Chaudhry, SBASSE](#), Open Quantum Systems Beyond the Born-Markov Regime

[Akhtaq Farid, SBASSE](#), Unravelling the Role of 1-Methylcyclopropene (1-MCP) in Fruit Softening and Ripening of Elite Mango Cultivars in Pakistan

[Amir Faisal, SBASSE](#), Pre-clinical Identification and Evaluation of Novel Therapeutic Strategies for Targeting Oral Cancer in Pakistan; Molecular Profiling Based Personalized Approach

[Basit Yameen, SBASSE](#), Solar Cell Performance Enhancement By Polymer Side Chain Engineering Transforming Biomass Ash Residues into Commercializable Products

Building from Scratch: How Nanomaterials Can Help Resolve Membrane Scaffold Geometry and Function

[Farasat Munir, SBASSE](#), Research and Development of a Low Cost Ventilator

Through Wall Intrusion Detection System with WiFi for Security Applications

Wide Area Surveillance System for Security and Infrastructure Monitoring Via a Sophisticated Radio Channel Modeling and Detection System

[Ghayoor Abbas Chotana, SBASSE](#), Development of an

Indigenous Process for the Synthesis of Plant Protection Fungicides for Ensuring National Food Security
Green Chemistry Route for the Concise and Divergent Synthesis of Halogenated Pseudilins

[Hassan Abbas Khan, SBASSE](#), Conversion Kit for UPS to a Pseudo-hybrid Converter with Scalable Architecture for Neighborhood Level Distribution Capability

[Ihsan Ayyub Qazi, SBASSE](#), A QoS Differentiation Framework for Next-Generation High-Speed Wifi Networks Design and Implementation of a Failure Resilient Network Load Balancer for Cloud Datacenters

[Irshad Hussain, SBASSE](#), Low-Cost but More Effective Transition Metal Alloy Nanoclusters for Electrocatalytic Water Oxidation

Smart Nanoclusters to Address Multidrug Resistance
Synthesis of Non-noble Electrocatalysts for Anion Exchange Membrane Fuel Cells (AEMFC)

[Kashif Zaheer Malik, MGS SHSS](#), Equity-Based Microfinance Contracts For Microenterprises

[Mohammad Usman Khan, MGS SHSS](#), Punjab Economic Report 2016 - The Punjab's Socio Economic Profile
Drafting Evaluation Policy, Punjab in Coordination with Directorate of Monitoring and Evaluation, Planning and Development Department and in Consultation with All Government Departments Engaged in Annual Development Program (ADP) Implementation

[Momin Ayub Uppal, SBASSE](#), Non-Orthogonal Multiple-Access for 5G Networks: Theory, Design, Prototyping, and Experimental Evaluation

[Muhammad Adeel Ahmed Pasha, SBASSE](#), Framework for High-level Power Estimation of Embedded Soft-Core Processors

[Muhammad Adeel Zahid, SBASSE](#), Indigenous PhD

Fellowships 5000 Phase II

Muhammad Hamad Alizai, SBASSE, Error Tolerant Communication Stack in Low-Power Wireless Networks

Muhammad Imran Cheema, SBASSE, A Rapid and Portable Optical Sensor Array for Detection of Salinity, Fluoride, and Arsenic in Water

Milk Contamination Sensor Based on Optical Fiber Cavity Ring Down Spectroscopy

Portable Optical Sensor for Rapid, Non-Invasive, and On-Site Diagnosis of Tuberculosis (TB)

Muhammad Imran Qureshi, SBASSE, Geometry and Topology of Weighted Flag Varieties and their Complete Intersections

Muhammad Saeed, SBASSE, Discovering Etiology Based Strategies for the Prevention and Treatment of Estrogen-induced Breast Cancer

Discovery and Development of Anti-dengue Therapeutics by Targeting the Virus-specific Proteases

Muhammad Tahir, SBASSE, A Low Cost, High Accuracy and Improved Integrity Cooperative Driver Assistance Platform for Enhancing Traffic Safety and Road Networks Efficiency

Muhammad Tariq, SBASSE, Reverse Genetics Approach to Link Epigenetic Cell Memory and Cell Signaling

Muhammad Zaheer, SBASSE, Designing Stable and Reusable Catalysts for the Development of a Hydrogen Battery from Biomass Derived Formic Acid

Mumtaz Ali Sheikh, SBASSE, Space Division Multiplexing in Optical Communication

Nadeem Ahmad Khan, SBASSE, 4 Class Motor Imagery Classification

Nauman Ahmad Zaffar, SBASSE, An Integrated System for Power Flow Control & Load Management

Design and Implementation of Brushless DC Motors

Grid Tied Solar Micro Inverter with Inverse Power Factor Correction

Naveed Arshad, SBASSE, A Smart Electric Grid in Pakistan with 100% Renewable Sources

Naveed UI Hassan, SBASSE, Targeting Consumer Behavior for Resource Optimization in Buildings Using Internet of Things and Machine to Machine Communications

Rahman Shah Zaib Saleem, SBASSE, Inhibition of Centrosome Clustering in Cancer Cells: An Approach to Selectively Eradicate Cancer Cells

Natural Dye Based High Efficiency Dye-sensitized Solar Cells

Salman Nosheer Arshad, SBASSE, Composite Carbon Nanofiber Based Nanostructured Electrodes For Enhanced Energy Storage In Lithium Ion Batteries

Shahid Masud, SBASSE, A Re-Configurable System-on-Module for Industrial Controls with IEEE 1588 IP Core Demonstrator

Shaper Mirza, SBASSE, Mechanisms of Immune Protection Induced by Pneumococcal Polysaccharide Vaccine

VERO Cell Immunogenicity and Safety after a One-week, 4-site, Intradermal (10) Pre-exposure Prophylaxis Regimen(4-4-4-0-0) and Four-weeks, 2-site, Intradermal (10) Pre-exposure Prophylaxis Regimen (2-2-2-0-2), 4-site 10 Booster After One Year

Syed Shahzad UI Hussan, SBASSE, Identification of Hepatitis C Neutralizing Antibodies and Structural Study of their Epitopes to Obtain Essential Information for Rational Vaccine Design

Uzair Kayani, SAHSOL, Alternative Legal Means for Protecting IP: Sale of Goods Act, Consumer Protection Courts, Provincial Food Authorities, and Quality Control Agencies

Regulatory Incentives for Foreign Direct Investments: BIT's, Targeted Partnerships, SEZ's, and Islamic Finance

Wasif Tanveer Khan, SBASSE, Design and Development of UHF/VHF Band Software Defined Radio

Design and Development of Filter Bank

Design and Development of Power Amplifier for T/R Module of Ground Based AESA Radar

Development of a Low-Cost Paper-based Wireless Early Warning System using Ink-jet

Printed Carbon Nanotube Loaded Antenna-based Sensors for Detecting Gases and Improvised Explosive Devices (IEDs)

GPS Interference Mitigation

Zubair Khalid, SBASSE, Development of Anisotropic, Fast, Robust and Sparse Spherical Signal Processing Methods with Application to Hydrology and Diffusion Tensor Imaging

CONSULTANCY PROJECTS (CP)

2016-17	Submitted	Funds Requested (PKR)
CP	17	27,153,540

2016-17	Approved	Approved Funds (PKR)
CP	14	24,896,040

Arif Zaman, SBASSE, Workshop on Classification and Regression

Jamshed Hasan Khan, SDSB, Course on Quantitative Method of Business for IMD MBA 2016

Muhammad Shakeel Sadiq Jajja, SDSB, Evaluation of Prequalification of Consulting Vendors for Government of the Punjab (2017-18)

Nadhra Shahbaz Naeem Khan, MGS HSS, Digital Documentation of Lahore Fort

Rasul Bakhsh Rais, MGS HSS, Conflict in Balochistan: Actors, Motives and Violence

Syed Zahoor Hassan, SDSB, Consulting and Various Engagements

Facilitation for Formulation of Group Vision, Mission and Values (V&V)

EXTERNAL TRAVEL GRANTS (ETG)

2016-17	Submitted	Funds Requested (PKR)
TG	50	15,092,656

2016-17	Approved	Approved Funds (PKR)
TG	29	7,338,073

Abubakr Muhammad, SBASSE, 12th International Conference on Hydroinformatics (HIC 2016), Korea

Ghazal Mir Zulfiqar, SDSB, 77th Annual Academy of Management Meeting, USA

Haiqa Ali, SDSB, World Finance Conference, Italy

Hamid Abdul Basit, SBASSE, Asia Pacific Software Engineering Conference, New Zealand

Hassan Abbas Khan, SBASSE, IEEE Power and Energy Society General Meeting, USA

IET Renewable Power Generation Conference, UK

ImdadUllah Khan, SBASSE, Asia Pacific Conference on Information Systems 2017, Malaysia

Imran Naeem, SBASSE, Mathematical Congress of the Americas 2017, Canada

Irfan Ahmad Qureshi, MGSHSS, INFER Annual Conference, France

Jawwad Nasar Chattha, SBASSE, IEEE International Conference on Communications, France

Junaid Haroon Siddiqui, SBASSE, IEEE ASM International Conference on Automated Software Engineering, Singapore

Kamran Ali Chatha, SDSB, 24th International Annual EurOMA Conference - Inspiring Operations Management, UK

Mariam Mohsin, SDSB, 33rd EGOS Colloquium 2017, Denmark

Momin Ayub Uppal, SBASSE, IEEE Vehicular Technology Conference (VTC) Fall 2016, Canada

Muhammad Abdur Rahman Malik, SDSB, 17th Bi-Annual Conference of Eastern Academy of Management - International, Australia

Muhammad Adeel Ahmed Pasha, SBASSE, IEEE/ACM Design Automation Conference, USA

Muhammad Fareed Zaffar, SBASSE, IEEE ACM International Symposium on Cluster Cloud and Grid Computing, Spain

Muhammad Faryad, SBASSE, 8th International Conference on Metamaterials, Photonic Crystals and Plasmonics (META 17), South Korea

Muhammad Kamran Nishat, SBASSE, International Conference on Emerging Networking Experiments and Technologies CoNEXT 2016, USA

Muhammad Shakeel Sadiq Jajja, SDSB, Australian and New Zealand Academy of Management Conference, Australia

Nauman Ahmad Zaffar, SBASSE, The 32nd Annual IEEE Applied Power Electronics Conference & Exposition (APEC 2017), USA

Syed Aun Raza Rizvi, SDSB, 2nd Applied Financial Modelling Conference, Australia

Syed Mohammad Irteza, SBASSE, IEEE International Conference on Computer Communications, USA

Talha Manzoor, SBASSE, The 20th World Congress of the International Federation of Automatic Control, France

Tariq Shamim Khwaja, SBASSE, SPIE Digital Optical Technologies International Symposium, Germany

Wajeaha Nafees, SBASSE, 12th Biennial International Conference on Sampling Theory and Applications, Estonia

International Conference on Systems, Signals and Image Processing IWSSIP 2017, Poland

Zainab Riaz, SDSB, PICMET '17 Conference: Technology Management for Interconnected World, USA

Zubair Khalid, SBASSE, IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP) 2017, USA

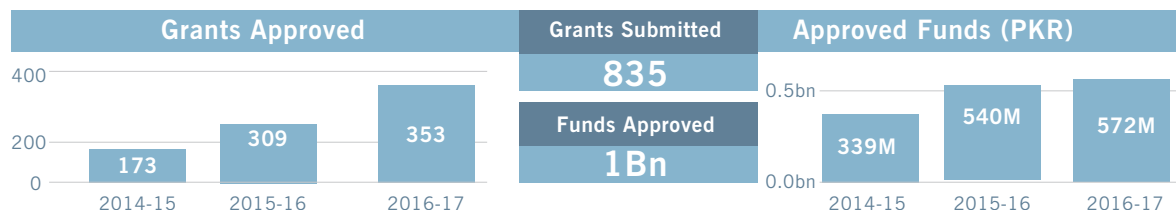
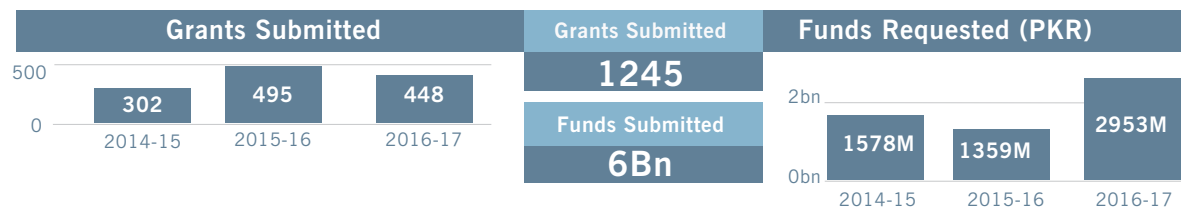
MEMORANDUM OF UNDERSTANDING (MoU)

2016-17	Submitted
MoU	22

MoU between LUMS and Aurat Foundation
 MoU between LUMS and Chughtai's Laboratory Ltd.
 MoU between LUMS and Haas School of Business, University of California, Berkeley
 MoU between LUMS and Harvard Business Publishing
 MoU between LUMS and Harvard University South Asia Institute
 MoU between LUMS and Huazhong University of Science and Technology (HUST)
 MoU between LUMS and Indus Hospital
 MoU between LUMS and Kazan National Research Technology University (KNRTU)
 MoU between LUMS and National Institute of Lasers and Optronics
 MoU between LUMS and Pakistan Commissioner for Indus Waters (PCIW)
 MoU between LUMS and Pakistan Television (PTV)
 MoU between LUMS and Punjab Aids Control Program, Primary and Secondary Healthcare, Government of Punjab
 MoU between LUMS and Regents of the University of California and the Lawrence Berkeley National Lab
 MoU between LUMS and Saarland University
 MoU between LUMS and Sage Publications, India
 MoU between LUMS and Shalamar Medical and Dental College (SMDC)
 MoU between LUMS and Tilburg University
 MoU between LUMS and University of Engineering and Technology, Lahore
 MoU between LUMS and University of Maryland
 MoU between LUMS and Urban Sector Planning & Management Services Unit of the Government of Punjab
 MoU between LUMS and World Wildlife Fund (Pakistan)
 MoU between NMF and Nestle

RESEARCH GRANT STATISTICS

EXTERNAL AND INTERNAL GRANTS



2014-2015

Submissions/Faculty	Funds Requested/Faculty	Approvals/Faculty	Funds Approved/Faculty
1.40	7.31M	0.79	1.48M

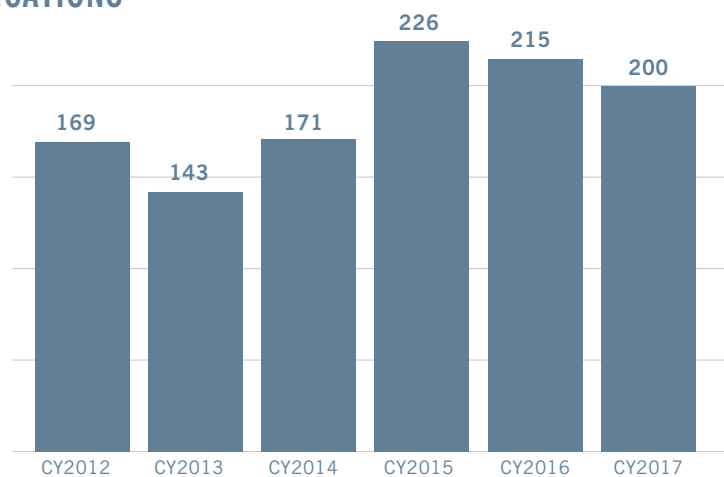
2015-2016

Submissions/Faculty	Funds Requested/Faculty	Approvals/Faculty	Funds Approved/Faculty
2.07	5.68M	1.37	2.48M

2016-2017

Submissions/Faculty	Funds Requested/Faculty	Approvals/Faculty	Funds Approved/Faculty
1.85	12.20M	1.27	1.31M

SCOPUS PUBLICATIONS



* Publications data is extracted from Scopus as on December 31, 2017.

SCOPUS PUBLICATIONS 2017

MUSHTAQ AHMAD GURMANI SCHOOL OF HUMANITIES AND SOCIAL SCIENCES (MGSHSS)

[Ali Usman Qasmi](#), Identity Formation through National Calendar: Holidays and Commemorations in Pakistan

Nations and Nationalism

[Hadia Majid](#), Patronage and Public Goods Provisioning in an Unequal Land

Social Indicators Research

[Hasan H. Karrar](#), Shanghai Spirit Two Decades On: Language, Globalization, and Space-making in Sino-Central Asian Cooperation

International Journal of the Sociology of Language

[Imtiaz Ul Haq](#), It's All in the Name: Mutual Fund Name Changes after SEC Rule 35 d-1

Journal of Banking and Finance

[Kashif Zaheer Malik](#), Oil Price Shock and its Impact on the Macroeconomic Variables of Pakistan: A Structural Vector Autoregressive Approach

International Journal of Energy Economics and Policy

[Maryam Wasif Khan](#), Hybridity in the Vernacular: Nineteenth-century Muslim Reform and Resistance

PMLA

The Oriental Tale and the Transformation of North Indian Prose Fiction

Modern Language Quarterly

[Mohammad Usman Khan](#), India-Pakistan: Second Trade Perception Survey

India-Pakistan Trade Normalisation: The Unfinished Economic

Agenda

[Muhammad Ahsan Rana](#), Perfect Strangers: The State and NGOs in Pakistan

Economic and Political Weekly

[Nida Kirmani](#), Resistance and its Limits: Protesting Urban Violence in Lyari, Karachi

Economic and Political Weekly

[Rashid Memon](#), Patronage and Public Goods Provisioning in an Unequal Land

Social Indicators Research

[Rasul Bakhsh Rais](#), Geopolitics on the Pakistan-Afghanistan Borderland: An Overview of Different Historical Phases

Geopolitics

[Syed Muhammad Hussain](#), Comparing the Effects of Discretionary Tax Changes between the US and the UK

B.E. Journal of Macroeconomics

[Syed Zahid Ali](#), Exchange Rate Pass Through, Cost Channel to Monetary Policy Transmission, Adaptive Learning, and the Price Puzzle

International Review of Economics and Finance

[Yunas Samad](#), Elections and Democratic Transition in Pakistan: One Step Forward and Two Steps Backwards

Commonwealth and Comparative Politics

SYED BABAR ALI SCHOOL OF SCIENCE AND ENGINEERING (SBASSE)

[Abubakr Muhammad](#), Structural Effects and Aggregation in a Social-Network Model of Natural Resource Consumption

IFAC-PapersOnline

[Adam Zaman Chaudhry](#), Analyzing the Quantum Zeno and Anti-Zeno Effects Using Optimal Projective Measurements

Scientific Reports

The Quantum Zeno and Anti-Zeno Effects with Strong System-Environment Coupling

Scientific Reports

[Adnan Ahmad](#), A Strategy to Reduce Grid Stress through

Priority-based Inverter Charging

Energy Procedia

[Adnan Khan](#), Modeling Transmission Dynamics of Ebola Virus Disease

International Journal of Biomathematics

[Ali Ashher Zaidi](#), A Functional Partial Differential Equation Arising in a Cell Growth Model with Dispersion

Mathematical Methods in the Applied Sciences

[Ali Jawaid](#), Diabetes Mellitus and Amyotrophic Lateral Sclerosis: Time to Bridge the Gap between the Bench and

the Bedside

European Journal of Neurology

Amer Rasheed, A Microscopic Study of MHD Fractional Inertial Flow through Forchheimer Medium

Chinese Journal of Physics

Simulations of a Fractional Rate Type Nanofluid Flow with Non-Integer Caputo Time Derivatives

Computers and Mathematics with Applications

Stabilized Approximation of Steady Flow of Third Grade Fluid in Presence of Partial Slip

Results in Physics

Amir Faisal, Characterisation of CCT271850, A Selective, Oral and Potent MPS1 Inhibitor, Used to Directly Measure In Vivo MPS1 Inhibition Vs Therapeutic Efficacy

British Journal of Cancer

Nicotine Exposure Augments Renal Toxicity Of 5-Azacytidine through P66shc: Prevention by Resveratrol

Anticancer Research

Synthesis and Evaluation of Modified Chalcone Based P53 Stabilizing Agents

Bioorganic and Medicinal Chemistry Letters

Ammar Ahmed Khan, Induced Alignment of a Reactive Mesogen-Based Polymer Electrolyte for Dye-Sensitised Solar Cells

RSC Advances

Arif Zaman, Sampling Based Efficient Algorithm to Estimate the Spectral Radius of Large Graphs

Proceedings - IEEE 37th International Conference on Distributed Computing Systems Workshops, ICDCSW 2017

Asim Karim, Exploiting Reject Option in Classification for Social Discrimination Control

Information Sciences

Ata Ulhaq, Measurement of the Spin Temperature of Optically Cooled Nuclei and GaAs Hyperfine Constants in GaAs/AlGaAs Quantum Dots

Nature Materials

Azmat K. M. Iqbal Hussain, A Stochastic Portfolio Optimization Model with Complete Memory

Stochastic Analysis and Applications

Babar A. Qureshi, ADM Energy and Infra-Gravitons

Physics Letters, Section B: Nuclear, Elementary Particle and High-Energy Physics

Basit Yameen, Antiplatelet Effect of Differentially Charged PEGylated Lipid-Polymer Nanoparticles

Nanomedicine: Nanotechnology, Biology, and Medicine

Chemically Reprogrammable Metal Organic Frameworks

(MOFs) Based on Diels-Alder Chemistry

Chemical Communications

Encapsulation of Antibiotic Levofloxacin in Biocompatible Microemulsion Formulation: Insights from Microstructure Analysis

Journal of Physical Chemistry A

Polymer Brush Functionalized SiO₂ Nanoparticle Based Nafion Nanocomposites: A Novel Avenue to Low-Humidity Proton Conducting Membranes

Polymer Chemistry

Targeted Brain Delivery Nanoparticles for Malignant Gliomas

Nanomedicine

Falak Sher, An Investigation of the Electronic, Structural and Magnetic Properties of the Ruddlesden-Popper Phase Sr₃RuCoO₇

Journal of Solid State Chemistry

Large Relative Cooling Power of Bi-doped La_{0.8-x}Bi_xSr_{0.08}(Ca_{0.55}Ba_{0.45})_{0.12}MnO₃ (x=0.0, 0.1 and 0.3) Perovskites: Magnetic and Magnetocaloric Properties

Ceramics International

Room Temperature Ferromagnetism in Single-Phase Zn_{1-x}Mnx Diluted Magnetic Semiconductors Fabricated by Co-Precipitation Technique

Applied Physics A: Materials Science and Processing

Structural, Magnetic and Magnetocaloric Properties of CoFe_{2-x}MoxO₄ (0.0 ≤ x ≤ 0.3) Ferrites

Ceramics International

Temperature and Composition Dependent Density of States Extracted using Overlapping Large Polaron Tunnelling Model in Mn_xCo_{1-x}Fe₂O₄ (x=0.25, 0.5, 0.75) Nanoparticles

Physica B: Condensed Matter

Zinc Modified Cadmium Titanite Nanoparticles: Electrical and Room Temperature Methanol Sensing Properties

Ceramics International

Ghayoor Abbas Chotana, Synthesis and Evaluation of Modified Chalcone Based p53 Stabilizing Agents

Bioorganic and Medicinal Chemistry Letters

Habib Ur Rahman, A Durable Superhydrophobic Coating for the Protection of Wood Materials

Materials Letters

Polymer Brush Functionalized SiO₂ Nanoparticle based Nafion Nanocomposites: A Novel Avenue to Low-humidity Proton Conducting Membranes

Polymer Chemistry

Hamid Abdul Basit, CodeEase: Harnessing Method Clone Structures for Reuse

IWSC 2017 - 11th IEEE International Workshop on Software Clones, co-located with SANER 2017

Retrieving Design Pattern Usage Examples Using Domain Matching

Proceedings - Asia-Pacific Software Engineering Conference, APSEC

Hassan Abbas Khan, Lifetime Maximization of Lead-Acid Batteries in Small Scale UPS And Distributed Generation Systems

2017 IEEE Manchester PowerTech Powertech 2017

Optimal Planning and Design of Low-Voltage Low-Power Solar DC Microgrids

IEEE Transactions on Power Systems

Solar PV Based Scalable DC Microgrid for Rural Electrification in Developing Regions

IEEE Transactions on Sustainable Energy

The Effect of Inverter Failures on the Return on Investment of Solar Photovoltaic Systems

IEEE Access

Ijaz Haider Naqvi, Non-GPS Positioning Systems: A Survey

ACM Computing Surveys

PILoT: A Precise IMU Based Localization Technique for Smart Phone Users

IEEE Vehicular Technology Conference

ImdadUllah Khan, Sampling Based Efficient Algorithm to Estimate the Spectral Radius of Large Graphs

Proceedings - IEEE 37th International Conference on Distributed Computing Systems Workshops, ICDCSW 2017

Spectral Methods for Immunization of Large Networks

Australasian Journal of Information Systems

Imran Naeem, Generalization of Approximate Partial Noether Approach in Phase Space

Nonlinear Dynamics

Symmetry Classification of Time-Fractional Diffusion Equation

Communications in Nonlinear Science and Numerical Simulation

Imran Younus, Angular Decay Coefficients of J/ψ Mesons at Forward Rapidity from p+p Collisions at s =510 GeV

Physical Review D

B -meson Production at Forward and Backward Rapidity in p+p and Cu + Au Collisions at sNN =200 GeV

Physical Review C

Cross Section and Transverse Single-spin Asymmetry of Muons from Open Heavy-flavor Decays in Polarized p+p Collisions at s =200 GeV

Physical Review D

Measurements of B_c^0/ψ at Forward Rapidity in p+p Collisions at s =510 GeV

Physical Review D

Measurements of e+e- Pairs from Open Heavy Flavor in p+p and d+A Collisions at s NN =200 GeV

Physical Review C

Nonperturbative-transverse-momentum Effects and Evolution in dihadron and Direct Photon-hadron Angular Correlations in p+p Collisions at s =510 GeV

Physical Review D

PHENIX Collaboration

Nuclear Physics A

Irshad Hussain, A Durable Superhydrophobic Coating for the Protection of Wood Materials

Materials Letters

A Superporous and Superabsorbent Glucuronoxylan Hydrogel from Quince (*Cydonia Oblanga*): Stimuli Responsive Swelling, On-Off Switching and Drug Release

International Journal of Biological Macromolecules

Cell to Rodent: Toxicological Profiling of Folate Grafted Thiomers Enveloped Nanoliposomes

Toxicology Research

Design, Characterization and Evaluation of Hydroxyethylcellulose Based Novel Regenerable Supersorbent for Heavy Metal Ions Uptake and Competitive Adsorption

International Journal of Biological Macromolecules

Development of Functionalized Hollow Microporous Organic Capsules Encapsulating Morphine - An In Vitro and In Vivo Study

Journal of Materials Chemistry B

Development of Silver-Nanoparticle-Decorated Emulsion-Templated Hierarchically Porous Poly (1-vinylimidazole) Beads for Water Treatment

ACS Applied Materials and Interfaces

Dopamine Coated Fe₃O₄ Nanoparticles as Enzyme Mimics for the Sensitive Detection of Bacteria

Chemical Communications

Durable and Self-Healing Superhydrophobic Surfaces for

Building Materials

Materials Letters

Evaluation of Chemically Modified Polysaccharide Pullulan as an Efficient and Regenerable Supersorbent for Heavy Metal Ions Uptake from Single and Multiple Metal Ion Systems

Desalination and Water Treatment

Fabrication of Superhydrophobic Filter Paper and Foam for Oil–Water Separation Based On Silica Nanoparticles from Sodium Silicate

Journal of Sol–Gel Science and Technology

Facile Method to Synthesize Dopamine-Capped Mixed Ferrite Nanoparticles and Their Peroxidase-Like Activity

Journal of Physics D: Applied Physics

Glucuronoxylan-mediated Silver Nanoparticles: Green Synthesis, Antimicrobial and Wound Healing Applications

RSC Advances

Molecular Basis of Cd²⁺ Stress Response in *Candida Tropicalis*

Applied Microbiology and Biotechnology

Synthesis of Water-soluble and Highly Fluorescent Gold Nanoclusters for Fe³⁺ Sensing in Living Cells using Fluorescence Imaging

Journal of Materials Chemistry B

Jahangir Ikram, A Collaborative Approach to Operate High Powered Devices on Small-scale PV Systems

Energy Procedia

Jawwad Nasar Chattha, Relay-Aided Non-Orthogonal Multiple Access with Noisy Network Coding

IEEE International Conference on Communications

Mashood N. M. Nasir, Efficiency Comparison of Alternating Current (AC) and Direct Current (DC) Distribution System at Residential Level with Load Characterization and Daily Load Variation

Proceedings of the Pakistan Academy of Sciences

Mian Muhammad Awais, A Multiclass Cascade of Artificial Neural Network for Network Intrusion Detection

Journal of Intelligent and Fuzzy Systems

Momin Ayub Uppal, A Practical Layered Multiplexed-Coded Relaying Scheme for Wireless Multicast

IEEE Transactions on Vehicular Technology

Relay-aided Non-Orthogonal Multiple Access with Noisy Network Coding

IEEE International Conference on Communications

Towards Design and Automation of Hardware-Friendly NOMA Receiver with Iterative Multi-User Detection

Proceedings – Design Automation Conference

Compress-and-forward Relaying: Prototyping and Experimental Evaluation Using sdrs

IEEE Vehicular Technology Conference

Muhammad Adeel Pasha, A Framework for High Level Simulation and Optimization of Coarse-Grained Reconfigurable Architectures

Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)

A Novel Split Radix Fast Fourier Transform Design for An Adaptive And Scalable Implementation

2016 IEEE 3rd International Symposium on Wireless Systems within the IEEE International Conferences on Intelligent Data Acquisition and Advanced Computing Systems, IDAACS–SWS 2016 – Proceedings

A Simulation Framework for Code-Level Energy Estimation of Embedded Soft-Core Processors

Simulation

Towards Design and Automation of Hardware-Friendly NOMA Receiver with Iterative Multi-User Detection

Proceedings – Design Automation Conference

Muhammad Aurangzeb Ahmad, Spectral Methods for Immunization of Large Networks

Australasian Journal of Information Systems

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