Electives at Stanford University

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I am a fourth year medical student at.The Aga Khan University Medical College, Karachi. Pakistan. In the summer of 2000, I had the privilege of spending some time at Stanford University, one of the most prestigious universities of the United States. This is a brief account of my trip and what I learned from it.

I began by writing to the Head of the Division of Vascular Surgery. stating my interest in the field and inquiring if he would accept me for the summer. Even though I barely had a month and a half of vacations, he accepted my application and atler completing the required visa formalities, I arrived in the United States on the 15th of June 2000.

I was assigned to a laboratory, which WUS involved in vessel biology research.[1] was given extensive training in the protocols for various molecular biology techniques which included Western blotting. Northern Blotting, RPA (RNAse Protection Assay). RT-PCR (Reverse Transcriptase Polymerase Chain Reaction), Radioactive labeling and detection. BrdU labeling and detection. Immunohistochemisti and In Situ Hybridization.

All experiments conducted in the laboratory were directed towards finding out the various factors resposible for bringing about the responses of normal and abnormal blood vessels to hemodynamic stress and the relationship, if any between these factors. Hemodvnam ic stress includes shear stress and tensile stress, which are exerted on the vessel wall by the flowing blood. Ditierent animal models were used to simulate these conditions and my work included performing microsurgeries on mice and rats to create arterio-venous fistulas between the abdominal aorta and vena cava. This resulted in ten times increased blood flow in the vena cava and thus served as the model for increased wall shear stress. I also created ligatures around the thoracic aorta in rats, which resulted in increased tensile stress on the portion before the ligature and decreased tensile stress after the ligature.

These animals were allowed to live for a specific period of time, after which, they were sacrificed and the blood vessels removed. I extracted total protein, DNA (Deoxyribo Nucleic acid) and RNA (Ribo Nulcic acid) from the tissue and performed qualitative as well as quantitative analysis on the extracts using the techniques mentioned above.

I also had the opportunity to attend two weeks of extensive clinical work. including vascular surgeries. morning rounds, indication meetings, weekly seminar and case presentations. In the end, I was given a letter of recommendation from the E)epartrnent. I am in the process of writing a review for the laboratory on the role of TGF —beta (Transforming Growth Factor - beta) in vascular remodeling under hemodynamic stress.

All in all, it was a memorable experience for me, because, in a very short period of time. I was able to peek into the broad field of research as well as learn some basic molecular biology. I had the chance to talk to some of the medical students there and compare their curriculum with the one used by medical institutions in Pakistan. My observation is that our curriculum gives very little importance to research work. Graduating medical students have very little research experience, if any solely based on their own personal interests. The importance of laboratory research cannot be overemphasized. Thus, I feel that the national curriculum followed by all medical institutions in Pakistan should include extensive courses on research methodology and medical students all over Pakistan should be encouraged to undertake research electives abroad.