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Interview

An Interview with Prof. Haval Shirwan

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Prof. Dr. Haval Shirwan

1. Could You Please Provide Your Personal Information & Photos (Portrait and One from Research (Laboratory, Clinic, Etc.))

I am a full professor with tenure in the Department of Child Health and Department of Molecular Microbiology and Immunology, School of Medicine, University of Missouri, Columbia, MO, USA. I obtained my PhD from the University of California in Santa Barbara, CA, and performed postdoctoral studies at the California Institute of Technology, Pasadena, CA. I held academic appointments at various institutions in the USA, including Cedars-Sinai Medical Center, Los Angeles, CA, Alleghany University of Health Science, Philadelphia, PA, and the University of Louisville, Louisville, KY, prior to my current position at the University of Missouri, Columbia. I am also directing an Immunomodulation and Translational Research Program at the University of Missouri and the Scientific Founder of three biotech startups focusing on immunomodulation.

https://medicine.missouri.edu/faculty/haval-shirwan-phd

2. Could You Please Tell Us Your Scientific Background?

I was trained as a molecular biologist and immunologist with a primary focus on translational research to prevent and treat immune-based disorders. I co-pioneered with Dr. Esma S. Yolcu the concept of generating novel immunological ligands and their transient and positional display on biologic and nonbiologic surfaces as a safe and practical alternative to gene therapy for localized immunomodulation with applications to transplantation, prevention/treatment of type 1 diabetes, and cancer immunoprevention/immunotherapy.

3. Can You Share Your Career Development Story Briefly? For Example, What Cases Have Influenced You the Most?

As an elementary school student growing up in a small village at the foot of the biblical Mount Ararat, I was amazed by the beauty of nature, particularly in the Spring when everything around me was coming to life after a harsh winter. This fascination with nature grew into a long-term quest to decipher nature's secrets and has since been my career objective. I was particularly interested in the host and pathogen interaction early in my scientific career and pursued my PhD at the University of California, Santa Barbara, investigating mechanisms by which IFN-γregulated the synthesis of viral macromolecules. Towards the completion of my graduate studies, I was influenced by the discovery of T cell receptor and the excitement it generated in the immunology field and switched gears to study how tolerance to alloantigens is established in the thymus and pursued my postdoctoral studies at the California Institute of Technology in Pasadena, CA. To take a translational approach to the modulation of alloreactive immune responses for tolerance induction to solid organs, I joined a liver transplant clinical team at Cedars-Sinai Medical Center, Los Angeles, CA, to study the molecular basis of allo and xenoantigen recognition. Regular participation in American Transplantation Congress meetings and discussions with my clinical colleagues gave me an appreciation for the need and importance of developing an immunosuppression-free protocols for achieving long-lasting graft survival. Since receptor/ligand interactions on the cell surface dictate immune responses and such interactions need not be long in duration, I conceived the concept of transiently displaying immunological ligands on the cell surface for immunomodulation. To achieve this goal, I and Dr. Esma Yolcu embarked on generating chimeric molecules that contain the

extracellular portion of immunological ligands with a modified form of streptavidin and the transient display of these molecules on biotinylated surfaces as a safe alternative to gene therapy for immunomodulation. The discovery of FasL as an apoptotic molecule and its role in the induction of tolerance to self-antigens in the 1990s provided a scientific rationale to focus on this pathway for tolerance induction. As a lead, a chimeric FasL molecule, SA-FasL, showed tolerogenic efficacy in various transplantation models and is presently being developed for the first-in-human trial for tolerance induction to allogeneic islets. This technology and its applications are subject to over a dozen issued and pending patents.

4. Is There a Book You've Read that You'd Recommend Universally (i.e., to Everyone You Meet)?

One Hundred Years of Solitude by Gabriel Garcia Marquez.

5. What is Your Main Research Area? What Got You Interested in Scientific Research in the First Place?

Immunomodulation with a focus on transplantation, autoimmunity, and cancer immunoprevention and immunotherapy.

6. Where are Your Sources of Information? Where do You Get Your Latest News about Transplant Research? Where do You Take Inspiration from?

Advances in digital communication have provided an effective means of acquiring information from various media sources focusing on transplantation and related matters.

7. What is Your Long-term Research Goal?

Translate the immunomodulatory concepts we established to the clinic for the treatment of graft rejection and prevention of type 1 diabetes and cancer.

8. What are the Recent Research Trends that You, as a Scholar, Would Suggest *OBM Transplantation* to Observe and to Follow in the Coming Years?

Technologies that target solid and cellular grafts for modulation before transplantation and those that embark on targeted delivery of biologics and immunosuppressive drugs to overcome rejection.

9. Do You Have Any Suggestions or Recommendations for Young Scientists, for Instance, Your Students and Young Collaborators?

Being passionate about what one does, realizing that important scientific discoveries require perseverance and hard work, and not being limited by scientific dogmas are important traits of accomplished scientists.

10. What do You Think of the Future of *OBM Transplantation*, an Open-access Journal? In Your Opinion, What Challenges and Developments Can We Expect to See in the Next Few Years in This Field?

OBM Transplantation, as an open-access journal, stands a great chance of serving the transplantation community across the globe. Focus on the quality of accepted manuscripts is key to the journal's success. Technological developments in multiomics provide an unparalleled opportunity to acquire a deep understanding of alloreactive immune responses and exploit this knowledge to formulate immunomodulatory approaches for immunosuppression-free graft survival.