Interview with Pankaj Arora, MD, Chair of the Early Career Committee

Tell us about your background and how you became involved with the FGTB Council?

Arora: Throughout my childhood in India, my mother instilled the belief that with hard work and dedication, I could one day become a physician who would make a difference in people’s lives. I received my medical degree from Manipal University, India, and underwent my internal medicine training at the Framingham Hospital. During residency, I joined the Framingham Heart Study for research training in complex trait genetics and genomics. I was fortunate to continue my training at Massachusetts General Hospital under the mentorship of Christopher Newton-Cheh, MD, MPH, and Thomas J. Wang, MD. During the course of my training, I decided to take up the challenge of explaining the molecular mechanisms by which one of the genetic variants we identified regulates natriuretic peptide levels. I was introduced to Kenneth D. Bloch, MD, a basic scientist. The experience of working in his laboratory exposed me to the trials and tribulations of bench science. Using genomics and molecular biologic tools, I identified a novel regulatory pathway for ANP expression involving a microRNA. The manuscript based on this work was published in Journal of Clinical Investigation. I was selected as one of four finalists for the FGTB Young Investigator Award at Scientific Sessions 2012 for this work. The opportunity became the backbone of my work as a volunteer with the FGTB Council, which led to becoming a member and subsequently Chair of the Early Career Committee.

Your work focuses on microRNA in cardiovascular disease and therapeutics. What approaches are you specifically using to drive your research?

Arora: Our current research work revolves around a central hypothesis that a deficiency in natriuretic peptide signaling promotes cardiometabolic disease and represents an important therapeutic target. Our group has developed expertise evaluating natriuretic peptide responses in humans in response to a variety of physiologic stimuli, including salt loading, carbohydrate challenge, etc. We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels in general population but investigate potential mechanisms of the putative associations. Lastly, we are pursuing studies in animal models to see if the anti-miR to this microRNA-425 could be a future therapeutic target for treating hypertension or heart failure.

For young scientists who are entering into the field, what advice would you give them and how can the AHA help to connect people with the right mentors or projects?

Arora: My advice to young post-docs and scientists is that key to developing a successful career is to ask the appropriate scientific question and then work hard in the laboratory to go after explaining the biology. You will often find that the true joys of science are hidden in the satisfaction of achieving the results of the scientific question that you went after. For my physician-scientists colleagues, make sure at every step of your research career that the key question of “clinical translation or relevance?” is brought up because that is where your unique strength lies.

Volunteering for AHA has made me realize the “impact” that one can create in the field of cardiovascular medicine not only at a national but also at an international level. Every year, AHA Scientific Sessions provide humongous opportunities and a unique platform to develop a broad network of multidisciplinary collaborations with eminent scientists which young trainees entering the field of cardiovascular medicine and research can take advantage of. The formal mentoring program in the FGTB Council is another such example of an opportunity that AHA provides.

We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels in general population but investigate potential mechanisms of the putative associations.

Pankaj Arora, MD

The Faculty of Genomics and Translational Biology, included the Council on Functional Genomics and the Translational Biology Council on Genetics. We have the potential for PMI to affect cardiovascular disease. While the PMI will emerge from the Precision Medicine Initiative, what is the potential for PMI to impact CVD? There remains great potential for PMI to impact CVD patient prevention. For example, we could identify which patients could have adverse side effects from CVD treatments for anthracyclines, blood pressure, dyslipidemia or clotting disorders. Alternatively, we could identify who would respond best to the same drugs in terms of efficacy. We could more precisely prescribe strength or aerobic exercise to people with specific variant alleles, or high or low fat diets to carriers of other alleles. The potential gain in knowledge that will emerge from this initiative is staggering.

Does the PMI affect early career investigators? If so, how? As the very first Chair so, how? Donna Arnett: PMI is a perfect field for early career investigators. The field requires multidisciplinary inquiry and cooperation to realize all of the potential benefits, from computer scientists and bioinformaticians to handle the massive data and storing of data repositories, to basic science investigators to evaluate the functional relevance and importance of findings, to clinicians to translate these findings into actual practice.

What does the AHA offer directly to investigators that is in line with the goals of the PMI? Arnett: Years ago, the AHA had the foresight to create an interdisciplinary working group that brought together Council members with an interest in functional genomics and translational biology. The working group eventually became a Council, and I had the pleasure of serving as the very first Chair of that Council. The group truly reflects the multifaceted scientific expertise required for success of the PMI.

We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels. We were introduced to Kenneth D. Bloch, MD, a basic scientist. The experience of working in his laboratory exposed me to the trials and tribulations of bench science. Using genomics and molecular biologic tools, I identified a novel regulatory pathway for ANP expression involving a microRNA. The manuscript based on this work was published in Journal of Clinical Investigation. I was selected as one of four finalists for the FGTB Young Investigator Award at Scientific Sessions 2012 for this work. The opportunity became the backbone of my work as a volunteer with the FGTB Council, which led to becoming a member and subsequently Chair of the Early Career Committee.

Your work focuses on microRNA in cardiovascular disease and therapeutics. What approaches are you specifically using to drive your research?

Arora: Our current research work revolves around a central hypothesis that a deficiency in natriuretic peptide signaling promotes cardiometabolic disease and represents an important therapeutic target. Our group has developed expertise evaluating natriuretic peptide responses in humans in response to a variety of physiologic stimuli, including salt loading, carbohydrate challenge, etc. We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels in general population but investigate potential mechanisms of the putative associations. Lastly, we are pursuing studies in animal models to see if the anti-miR to this microRNA-425 could be a future therapeutic target for treating hypertension or heart failure.

For young scientists who are entering into the field, what advice would you give them and how can the AHA help to connect people with the right mentors or projects?

Arora: My advice to young post-docs and scientists is that key to developing a successful career is to ask the appropriate scientific question and then work hard in the laboratory to go after explaining the biology. You will often find that the true joys of science are hidden in the satisfaction of achieving the results of the scientific question that you went after. For my physician-scientists colleagues, make sure at every step of your research career that the key question of “clinical translation or relevance?” is brought up because that is where your unique strength lies.

Volunteering for AHA has made me realize the “impact” that one can create in the field of cardiovascular medicine not only at a national but also at an international level. Every year, AHA Scientific Sessions provide humongous opportunities and a unique platform to develop a broad network of multidisciplinary collaborations with eminent scientists which young trainees entering the field of cardiovascular medicine and research can take advantage of. The formal mentoring program in the FGTB Council is another such example of an opportunity that AHA provides.

We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels in general population but investigate potential mechanisms of the putative associations.

Pankaj Arora, MD

Donna Arnett, PhD, FAHA, on Precision Medicine Initiative

Will the PMI lead to better therapies and prevention strategies for patients with CVD?

Arnett: While the field of cardiovascular disease is not as advanced in some fields, such as cancer, there remains great potential for PMI to impact CVD treatment and prevention. For example, we could identify which patients could have adverse side effects from CVD treatments for anthracyclines, blood pressure, dyslipidemia or clotting disorders. Alternatively, we could identify who would respond best to the same drugs in terms of efficacy. We could more precisely prescribe strength or aerobic exercise to people with specific variant alleles, or high or low fat diets to carriers of other alleles. The potential gain in knowledge that will emerge from this initiative is staggering.

Does the PMI affect early career investigators? If so, how?

As the very first Chair so, how? Donna Arnett: PMI is a perfect field for early career investigators. The field requires multidisciplinary inquiry and cooperation to realize all of the potential benefits, from computer scientists and bioinformaticians to handle the massive data and storing of data repositories, to basic science investigators to evaluate the functional relevance and importance of findings, to clinicians to translate these findings into actual practice.

What does the AHA offer directly to investigators that is in line with the goals of the PMI? Arnett: Years ago, the AHA had the foresight to create an interdisciplinary working group that brought together Council members with an interest in functional genomics and translational biology. The working group eventually became a Council, and I had the pleasure of serving as the very first Chair of that Council. The group truly reflects the multifaceted scientific expertise required for success of the PMI.

We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels. We were introduced to Kenneth D. Bloch, MD, a basic scientist. The experience of working in his laboratory exposed me to the trials and tribulations of bench science. Using genomics and molecular biologic tools, I identified a novel regulatory pathway for ANP expression involving a microRNA. The manuscript based on this work was published in Journal of Clinical Investigation. I was selected as one of four finalists for the FGTB Young Investigator Award at Scientific Sessions 2012 for this work. The opportunity became the backbone of my work as a volunteer with the FGTB Council, which led to becoming a member and subsequently Chair of the Early Career Committee.

Your work focuses on microRNA in cardiovascular disease and therapeutics. What approaches are you specifically using to drive your research?

Arora: Our current research work revolves around a central hypothesis that a deficiency in natriuretic peptide signaling promotes cardiometabolic disease and represents an important therapeutic target. Our group has developed expertise evaluating natriuretic peptide responses in humans in response to a variety of physiologic stimuli, including salt loading, carbohydrate challenge, etc. We are also leveraging the rapid growth of human genetics to not only identify genetic variants associated with natriuretic peptide levels in general population but investigate potential mechanisms of the putative associations. Lastly, we are pursuing studies in animal models to see if the anti-miR to this microRNA-425 could be a future therapeutic target for treating hypertension or heart failure.

For young scientists who are entering into the field, what advice would you give them and how can the AHA help to connect people with the right mentors or projects?

Arora: My advice to young post-docs and scientists is that key to developing a successful career is to ask the appropriate scientific question and then work hard in the laboratory to go after explaining the biology. You will often find that the true joys of science are hidden in the satisfaction of achieving the results of the scientific question that you went after. For my physician-scientists colleagues, make sure at every step of your research career that the key question of “clinical translation or relevance?” is brought up because that is where your unique strength lies.

Volunteering for AHA has made me realize the “impact” that one can create in the field of cardiovascular medicine not only at a national but also at an international level. Every year, AHA Scientific Sessions provide humongous opportunities and a unique platform to develop a broad network of multidisciplinary collaborations with eminent scientists which young trainees entering the field of cardiovascular medicine and research can take advantage of. The formal mentoring program in the FGTB Council is another such example of an opportunity that AHA provides.