

Fellows Corner

How to Formulate a Research Question

By Nathan Hellmann

All renal fellows are required to perform some type of research during the course of their training. For some, this research will be a stepping stone to a career in academic nephrology. For others, the research years will be a brief sojourn into a different realm for a year or two, until private practice beckons. Out of the myriad options available, how does one choose a worthy research question?

Choosing a research mentor is intimately linked to choosing a research question. Except for the few brave souls who are already independently minded (and independently funded) coming into fellowship, nephrology fellows will need to find a mentor, someone who will not only help develop the research question into a full-fledged independent project, but also provide career advice and allow fellows to build upon previous discoveries and techniques developed by the lab.

Finding the right mentor and the right project can be a challenge, particularly when nephrology fellows are required to commit to a specific laboratory very early on, usually during the notoriously difficult clinical year during which free time can be hard to come by. Fellows are typically asked to commit to a given “track”—basic science, clinical research, and clinician-educator are common choices—that allows fellowship programs to plan for the future and ensure a healthy balance of research and clinical fellows.

“I think in general you need to choose the best combination of mentor and project that fits with your individual needs,” said Jonathan Bazeley, MD, a recent graduate of the University of Michigan nephrology fellowship program. “Something which really helped [in our nephrology fellowship program] was that renal fellows have a protected two-week block of time halfway through the clinical fellowship intended for fellows to go around and interview with the faculty of the nephrology division to discuss potential projects.”

Not all nephrology fellowship programs have such blocks, so most would agree that fellows will need to set aside some time to discuss possible experimental ideas with poten-

tial mentors in anticipation of the upcoming research years. Talking directly with current and former fellows about a given mentor can also be invaluable in identifying potential conflicts or mismatches before they occur.

Although some fellows may feel uncomfortable making such decisions so early on in their fellowship, a case can be made that it justly forces fellows to ask themselves essential questions about where they see their career evolving. The choice of mentor may be very different depending on whether or not an individual wants to stay within academics or begin their clinical practice career.

A large, 30-plus person laboratory studying mechanisms of transplant immunobiology may not be the best fit for an individual without much research experience who simply wants to develop a clinical practice after completing fellowship. Large labs tend to favor individuals with an ability to carry out a project independently. This is not to say that fellows who do not anticipate staying within research should automatically rule out the possibility of trying a basic science lab. In the right scenario with good one-on-one mentoring, a rewarding research experience can be achieved.

For individuals who think they want to have a career predominantly in research, the decision as to which mentor and research question to choose are even more critical. Should one choose the department head who has 258 publications to his name, access to exciting scientific reagents or databases, but will only be able to meet individually with fellows once every three months? Or should one choose the up-and-coming junior faculty member who is able to provide lots of individual attention and quality mentoring but may be unable to provide guaranteed funding for the duration of the project? Ultimately, the decision comes down to the individual, but most would agree that a good rapport with the mentor should exist prior to joining the lab.

Narrowing down the focus

Key to a good research question is how to narrow down the focus to a question specific enough to obtain meaningful conclusions, but glo-

bally interesting to the field of nephrology. Someone who hopes to stay in research may choose to tackle an ambitious, long-term project—think something along the lines of “developing an animal model to determine the permeability factor responsible for FSGS,” for example. Someone who prefers to restrict his or her time in the lab to only one to two years and a guaranteed publication or two might decide instead to mine existing patient databases for factors that predispose toward CKD in a specific patient subpopulation. Regardless of the scope, asking the following questions can be useful in honing in on a research focus:

1. Is the question I’m asking important? Even for basic science types, in the current funding climate it is often necessary to justify a project based on its relevance to human disease.
2. Is the project doable in the allotted amount of time? More ambitious, long-term projects should be embarked on only by those with the stomach for a long-term research career. Knowing what tools are available to you is essential for answering this question.
3. Is my research question specific enough? Generally speaking, the more specific, the better. It’s not enough to say, “I want to study dialysis access.” Instead, ask a directed question such as, “I want to study the incidence/prevalence rates of AV fistula use in this subpopulation of the ESRD population using this particular database and using these particular statistical techniques.”
4. Will I be funded? Many nephrology programs have a training grant that can guarantee fellow funding for research. However, not all fellows (particularly those from abroad) are eligible for these grants. Many programs strongly encourage individuals to apply for their own funds. It’s much better to know about these policies ahead of time.

Finally, it’s important to realize that nothing is set in stone. The research question a fellow investigates can evolve dramatically. John Forman,



MD, a nephrologist at Brigham and Women’s Hospital who has published several important papers regarding the epidemiology of hypertension, started his fellowship research in a basic research lab before switching to a clinical research pathway after a full year of research.

“I found that at the end of the day, I would be much more interested in talking about clinical research questions than basic research questions, and I realized that I could be very happy pursuing a career in clinical research,” Forman said.

Having to change one’s research focus is not altogether uncommon, especially in light of the difficulties of grant writing or experimental planning during the clinical year. In terms of formulating an appropriate research question, Forman noted the importance of having the fellow choose the actual question with guidance from the mentor, rather than simply being handed a research project. “You’ve got to pick something that you can do in a relatively short period of time with the resources available to you,” he said.

Although formulating the research question may seem intimidating to the early nephrology fellow, many find it among the most useful lessons of fellowship and see the process as an essential part of their education. ●

Renal fellow Nathan Hellman, MD, passed away February 13, 2010. Hellman had been a member of the ASN Kidney News editorial board.