Researcher Profiles

Napoleone Ferrara Genentech Fellow: Molecular Oncology

Profile | Avastin Involvement | Education/Background | Top Scientific Papers | Awards & Honors

"I joined Genentech in 1988 after finishing a postdoc at the University of California, San Francisco (UCSF). The reputation for great science, combined with a flexible and entrepreneurial atmosphere, were the major factors in my decision to join Genentech. I had an opportunity to appreciate all of these aspects very soon. Even though my initial project was the development of models to study the activity of relaxin, a hormone thought to be involved in the functioning of the human reproductive system, I also had the freedom to pursue my favorite project, which involved studying a novel vascular endothelial cell growth factor (VEGF) and the biology of the human VEGF protein. I doubt that this would have been possible in other companies."

Current Projects "The main research theme of my lab is the regulation of angiogenesis (the formation of new blood vessels). We identified the gene for human VEGF in 1989 and then characterized this molecule as a major regulator of angiogenesis in a broad variety of circumstances, including embryonic development, reproductive functions and endochondral bone formation. In addition, we demonstrated that VEGF is a key mediator of tumor angiogenesis. These studies led to the development of a humanized anti-VEGF antibody, Avastin® (bevacizumab, rhuMAb-VEGF), which received FDA approval in February 2004 for treatment, in combination with 5-FU based chemotherapy, of first line metastatic colorectal cancer. The pivotal Phase III study on Avastin in metastatic colorectal cancer was the first clinical validation of the long-pursued anti-angiogenic hypothesis: that by interfering with a tumor's blood supply, you may inhibit tumor growth and metastasis and thereby provide health benefits to cancer patients.

My lab's studies on the role of VEGF in intraocular neovascularization also led to the clinical development of an anti-VEGF antibody fragment, Lucentis™ (ranibizumab), as a potential therapy for wet age-related macular degeneration. In October 2002, I was pleased when a Phase Ib/II study of Lucentis in the wet form of age-related macular degeneration (AMD) yielded positive preliminary data, validating VEGF as an important target in the pathogenesis of wet AMD and leading to the initiation of Phase III trials in Lucentis. Overall, I am very excited about this investigational anti-VEGF product and its potential role in the treatment of various diseases with high unmet medical needs.

Currently, my lab is investigating mechanisms of tumor angiogenesis alternative to VEGF, as well as studying novel, tissue-selective, endothelial cell mitogens. As part of this latter initiative, my team isolated endocrine gland vascular endothelial growth factor (EG-VEGF), a molecule that forms new blood vessels only in endocrine-system tissues. This breakthrough finding suggests that there may be ways to turn the blood supply on and off to specific parts of the body — a finding that may have therapeutic implications not only for cancer, but heart disease, wound healing, and blindness. My team's findings about EG-VEGF were published in *Nature* in August 2001 and have been summarized on PubMed.

Collaborations "Over the last 14 years, I have engaged in extensive collaborations with scientists at Genentech as well as from many universities. These collaborations have played a major role in moving my various projects forward. Among the most gratifying have been my collaborations with Genentech colleagues in the humanization of an anti-VEGF antibody and with Kenneth Hillan in analyzing the morphology of knockouts and many other phenotypes."

Inspiration/Vision "I am inspired by the possibility of combining exciting basic science with the development of novel therapies for important diseases with an unmet medical need. The field of angiogenesis is exquisitely suitable for such a combination."