

Building Better Institutions

WHAT IS THE BEST WAY TO PROMOTE INNOVATIVE RESEARCH? HOW CAN WE BUILD RESEARCH institutions of the future that will promote cross-disciplinary interactions among young creative minds? Despite the recent growth in scientific knowledge, conventional discipline-based methods have not been sufficiently effective at developing new understanding and treatments. Researchers need to be encouraged to identify important questions and tackle them with multidisciplinary approaches. Contemporary biomedical research has to integrate biological, nonbiological, and clinical disciplines, and its application requires interactions with hospital and commercial partners. This can be facilitated by research institutions with an environment that supports strong interdisciplinary interactions between scientists: a place where laboratory biologists are encouraged to collaborate with clinical researchers to understand the medical implications of their work, with pharmaceutical companies for the translation of discoveries into treatments, and with physical scientists to expand their thinking and repertoire of experimental approaches. Such an institution must be continually open to new ideas and permeable to interactions with outside researchers and organizations.

Another imperative is to support early career scientists in setting up their own independent research programs. This initial period, when young investigators are often at their most creative, frequently sees them rein in their ambition and originality, given the pressures of securing grant funding and establishing a laboratory group. Too often this results in derivative research goals and aspirations driven by incremental objectives. New principal investigators need a supportive research environment, secure research funding, and time to make important discoveries.

New institutions have adopted different approaches to promote innovative and collaborative atmospheres, including the Janelia Farm Research Campus and more recently the Francis Crick Institute, opening in London in 2015. The Crick will be a large institute (120 groups) with a broad and diverse research agenda. Cross-disciplinary and clinical interactions will be forged with researchers from three university partners (University College London, Imperial College London, and King's College London) and the Wellcome Trust Sanger Institute, through the reciprocal interchange of small satellite groups of one to three researchers. And the institute will encourage exchanges and visits from other research institutions, including the for-profit sector and health care delivery organizations. Architecturally, the institute has been designed to resemble a chromosome, with the four arms meeting at a "centromere" that facilitates informal encounters and exchanges. The largely open-plan laboratories will juxtapose groups with different interests and encourage their mixing.

Rather than traditional departments, Crick investigators will self-organize into interest groups focused around research questions or technical approaches. Researchers will be free to join as many or as few of these as they wish, and the groups will come and go as science develops. Moreover, around two-thirds of the Crick's research group leaders will be in the initial phase of their independent careers, with a smaller number of more senior investigators to mentor younger colleagues and help identify the best new recruits. These appointments will be of up to 12 years, supported by the Crick's funding partners (the Medical Research Council, Cancer Research UK, and the Wellcome Trust). Group leaders will then leave the institute to establish a research group elsewhere; the aim is to give researchers who are effective and remain in the United Kingdom a transition package to support their moves, creating a thriving network of highly trained researchers.

Francis Crick commented that "by the time most scientists have reached age thirty they are trapped by their own expertise." It is fitting that Crick's eponymous institute aims to develop a culture that escapes this constraint.

— Paul Nurse, Richard Treisman, Jim Smith

10.1126/science.1242307

Paul Nurse is president of the Royal Society and director of the Francis Crick Institute, London, UK.

Richard Treisman is director of the Cancer Research UK London Research Institute and research director at the Francis Crick Institute, London, UK.

Jim Smith is director of the Medical Research Council–National Institute for Medical Research and research director at the Francis Crick Institute, London, UK.



Science

Building Better Institutions

Paul Nurse, Richard Treisman and Jim Smith

Science **341** (6141), 10.

DOI: 10.1126/science.1242307

ARTICLE TOOLS

<http://science.sciencemag.org/content/341/6141/10>

PERMISSIONS

<http://www.sciencemag.org/help/reprints-and-permissions>

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2013, American Association for the Advancement of Science