Doing Multidisciplinary Research

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Forms of Collaboration Across the Disciplines

'Multidisciplinary', 'cross-disciplinary', 'interdisciplinary', 'pluridisciplinary', 'transdisciplinary'

Multidisciplinary
Multiple disciplines collaborate without significant cross-fertilisation of theories, methods and epistemologies

Interdisciplinary
Incorporates explicit integration of disciplinary perspectives and methods

Transdisciplinary
A new hybrid field of inquiry emerges from an extended period of collaborative work (e.g., psychoneuroimmunology)

Promoting multi-disciplinary and inter-disciplinary ageing research in the United Kingdom

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ABSTRACT

Multi-disciplinary and inter-disciplinary working has for long been advocated in gerontology, and sometimes contested. Although collaboration between disciplines is common practice in many areas of ageing research, much remains to be done to develop and support such work. Internationally, funding agencies, scientific associations and other stakeholders in ageing research are actively involved in establishing the methods and means to promote cross-disciplinary co-operation in the field. In the United Kingdom (UK) since the late 1990s, the statutory Research Councils with key interests in ageing and older people have been actively pursuing research programmes that feature multi-disciplinarity and inter-disciplinarity. The National Collaboration on Ageing Research (NCAR), a partnership among four of the Research Councils to stimulate cross-disciplinary

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Multidisciplinary Research: Today's Hottest Buzzword?

By Elisabeth Pain
January 03, 2003

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Bioinformatics, bioengineering, nanobiotechnology, biomimetic robotics, biophysical chemistry ? These days it sounds as if you can pick and mix scientific disciplines to make your own. But can you really? How easy is it for early-career scientists to become multi-, inter-, or even transdisciplinary? And for a start, what's the difference between all those terms?

Multidisciplinarity has a LOT to offer to early-career scientists in terms of opportunities and excitement.

Multi- (or pluri-) and interdisciplinary research are often used interchangeably (including by Next Wave ?), but originally they referred to different approaches. When experts from different fields work together on a common subject within the boundaries of their own discipline, they are said to adopt a multidisciplinary approach. However, if they stick to these boundaries they may reach a point where the project cannot progress any further. They will then have to bring themselves to the fringes of their own fields to form new concepts and ideas--and create a whole new, interdisciplinary field. A transdisciplinary team is an interdisciplinary team whose members have developed sufficient trust and mutual confidence to transcend disciplinary boundaries and adopt a more holistic approach.

So is multi- (or inter- or trans-) disciplinarity today's hottest buzzword in scientific careers? Well, judging by the numerous conferences and training programmes around the world, it certainly looks like it. Last September, for example, a National Research Council panel in the United States issued a report ⊡ entitled "Bio2010: Transforming

Perils and Pleasures of Multidisciplinary Research
(Baker, *Urban Ecosystems*, 9, 2006)

◆ *The Escher Staircase* – initial tendency for each discipline to look down on others, unaware that others are looking down on it

◆ *The Emperor Has No Clothes* – in multidisciplinary research, in the light of broad enquiry, the weakness of our cherished paradigms may become exposed

◆ *The Tower of Babel* – disciplinary isolation produces different languages

◆ *Trusting strangers* – individual disciplines have their own cultures (language, reward systems, research approaches)

Perils and Pleasures of Multidisciplinary Research
(Baker, 2006)

- *Dividing the loaf* - disciplines deal with money in very different ways

- *Playing with others* – traditional disciplines tend to work in small hierarchical groups; multidisciplinary groups are generally not hierarchical

- *Publish or perish* – expectations for publication are somewhat different across disciplines

- *Finding Nirvana* – satisfaction with multidisciplinary working can lead to transdisciplinary understanding

Barriers to Multi- and Interdisciplinarity in Research (Bruun, Hukkinen and Klein, 2005)

- *Structural impediments* – the organisation of science and associated incentives

- *Lack of knowledge* – unfamiliarity with other disciplines and of a vision of their potential contributions, values and language

- *Cultural obstacles* – differing accepted understandings, practices, values and language

- *Epistemological differences* – divergent disciplinary world views

- *Methodological differences* – varying styles of enquiry

- *Psychological factors* – attitudes and disciplinary identity

- *Reluctant reception* – lack of understanding of the value of interdisciplinary research by non-scientific audiences

Minimising Disincentives to Collaborative Research (Larson, *Nursing Outlook*, 2003)

◆ *Time and communication* – multidisciplinary research requires more time for communication; having conversations early and often to facilitate understanding among the disciplines is crucial

◆ *Leadership demands* – leaders must be identified early, have the 'right touch', acceptable to collaborators, able to articulate the goals of the project, establish a collaborative culture of trust and sharing in which team members share credit

◆ *Shared resources and revenue* – agreements about the expectations and needs of all team members

◆ *Equal effort across team* – defining clear roles and responsibilities, setting time lines and convening frequent group meetings can help reinforce team functioning

'Connectivity' as a Discipline-Bridging Concept

◆ White, D.R. And Harary, F. (2001). 'The cohesiveness of blocks of social networks: node *connectivity* and conditional density.' *Sociological Methodology*, 31: 305-359.

◆ Narayanan, A., Jain, A. and Boonder, B. (2005). 'Providing rural *connectivity* infrastructure: ICT diffusion through private sector participation.' *International Journal of Services Technology and Management*, 6(3-5): 415-436.

◆ Brierly, G., Friyers, K., and Jain, V. (2006). 'Landscape *connectivity*: the geographic basis of geomorphic applications.' *Area*, 38(2): 165-174.

◆ ESRI. (2006). *ArcGIS* Schematics: Dealing with *Connectivity*. Redlands, California: ESRI.