

AN INTEGRATED APPROACH

UKCMRI will champion an approach in which teams working in different disciplines collaborate to uncover fundamental biological mechanisms relevant to human health. Groups spanning the biological, clinical and physical sciences will share insight and techniques to capture a more complete understanding of life's processes.

A deep understanding of biological phenomena now demands the application of multiple techniques at different scales, from the molecule to cell to whole organism.

Each approach has its advantages. But to obtain a complete picture, evidence from each level must be integrated. Moreover, research is often mutually dependent – one set of experiments raises questions that other techniques might be better placed to answer. Research programmes increasingly need to apply ever more diverse techniques, to develop new approaches and to be more interdisciplinary.

In recognition of this new era, UKCMRI will be founded and run as a multidisciplinary research centre without discipline-based departmental subdivisions. Researchers will be encouraged to share insight and strategy and to work towards common ends – a better understanding of basic biology and disease mechanisms. Interest groups will be set up to enable scientists with common interests to come together to share insights and plan activities.

Effective multidisciplinarity requires a critical mass of researchers, to ensure that multiple skills are represented to sustain core facilities supporting research programmes. The scale of UKCMRI is thus key to its vision, as is its ability to tap into high-quality research fields outside traditional biomedicine, such as the physical sciences, engineering, maths and computing through its links to UCL centres and other institutions.

Multidisciplinarity is also a guiding principle of the design of the UKCMRI building. It will be arranged to encourage informal



interactions, with many common areas. Except when they need access to shared equipment, research teams will not be grouped according to areas of interest, again to promote mixing and exposure to alternative ways of thinking.

To achieve this vision, individuals will need to be able to expand their ability to communicate with





scientists from other disciplines, and be ready to develop their skills and their appreciation of the potential of novel technologies. Development of researchers – at all levels from graduate student upwards – will be a high priority. With translation and human applicability also vital, non-clinical researchers will receive training in human biology and pathology, so they can appreciate the clinical implications and applications of their research, as well as the special characteristics of experimental medicine.

To further stimulate collaborations, a programme of visiting fellows will be established, to bring in individuals with fresh ideas, insight and techniques, and to lay the foundations of longer-term collaborations.

Technological innovation

Scientific progress is intimately linked to the development of new technologies, which can greatly accelerate the pace of research and open up fruitful new areas of study. Technological innovation will lie at the heart of UKCMRI, with core facilities providing a central resource to facilitate research across the institute.

The interaction will be two-way, as emerging technologies developed in individual labs can be refined in core facilities and then rolled out for wider use – in UKCMRI, other UK biomedical research institutions and around the world.

Translation as standard

Although discovery will lie at the heart of UKCMRI, it will be discovery with a purpose – to



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improve people's health and well-being. The potential for practical application will be integral to UKCMRI's work.

By encouraging interactions between basic and clinical scientists – and with a proportion of researchers being clinically trained – translational potential will be firmly embedded within UKCMRI's research programmes. Extensive links with local clinical centres will help to define research priorities and also provide a route through which clinical application can be progressed. UKCMRI will not itself house patient facilities, but a wealth of well-equipped specialist centres exist within a short distance.

With application one of the core principles of UKCMRI, technology transfer will be a fully integrated activity. UKCMRI researchers will work closely with the existing technology transfer bodies of the founding partners and the centre will also have its own technology transfer staff.

UKCMRI will also establish links with pharmaceutical and biotech sectors, to provide additional routes by which research can be taken forward. An industry 'club' will be established to increase exposure to translation and innovation, and a seminar series devoted to clinical, technological and commercial development of research will be organised. As well as visiting fellows from academia, industry researchers will work on secondment within the centre.

Most importantly, clinical translation and technology transfer will be seen as valued activities with equal prestige to discovery research, to ensure that application permeates the culture of UKCMRI.

