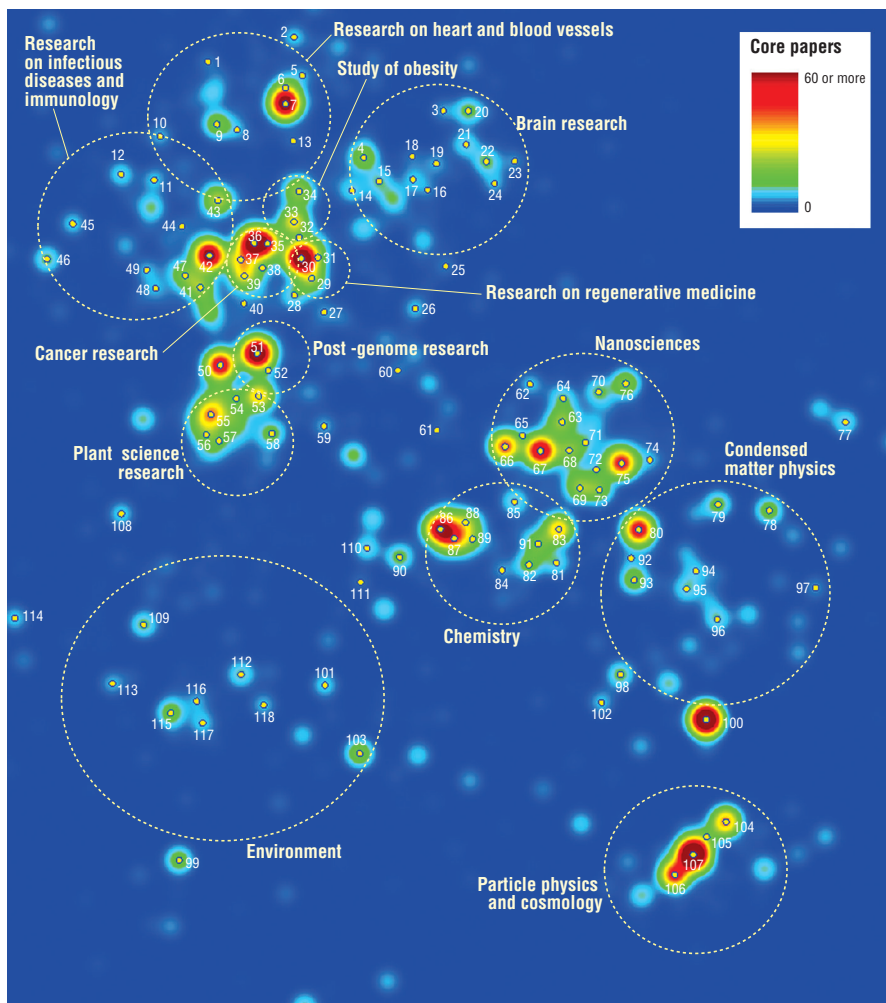


CONVERGENCE OF SCIENTIFIC FIELDS

Increasingly, innovations are achieved through the convergence of scientific fields and technologies. The interaction of research disciplines may also lead to new research areas. For example, “nanoscience” research has arisen from the interaction of physics and chemistry and is interdisciplinary in character. “Nanoscience” is also somewhat attracted to the life sciences, both directly and indirectly, as measured by co-citation links. While interactions between nanoscience and life sciences are not yet strong enough to establish a research domain, the space between them may become the ground for a new area, e.g. bio-nanoscience.

Hot research areas on a science map, 2008



Note: The yellow dots indicate the location of hot research areas. The numbers next to the yellow dots are the hot research areas' ID numbers. Gradations on the map correspond to the density of core papers. Warm colours represent greater concentrations of core papers, with colours becoming cooler as the density of core papers decreases.

What is a hot research area?

Knowledge creation and flows in cutting-edge research are transmitted through the exchange of information among researchers. Citation of scientific papers is one source of knowledge flows. Analysis of citations and the identification of core papers – those that play a central role in research areas – make it possible to examine research areas and the relations among them. Research areas are identified here via a two-stage clustering of the top 1% of highly cited research papers by using “co-citation” analysis. Co-citation involves a set of papers that is cited simultaneously in other papers. “Hot” research areas are characterised by a high level of citation activity.

Source: Saka, A., M. Igami and T. Kuwahara (2010), based on tabulations from Thomson Reuters' “Essential Science Indicators”.