correspondence

Comment on the
multi-person interview:
“The future of research
universities”

As the interviewees in *EMBO reports*' recent multi-person interview on the future of research universities made clear, universities continue to play a crucial role in the future of knowledge-based economies at the beginning of the twenty-first century. Although universities have also played a vital role in the invention and success of industry-based capitalism in the preceding centuries (Nelson, 1990), the current political and economic changes towards a knowledge-based society might be the main determinants for the future of research universities. The knowledge-based society itself is the result of a change in market capitalism to 'technocapitalism', which is characterized by its reliance on scientific research and technological innovations (Suarez-Villa, 2000, 2001, 2003).

Intangible values, such as creativity and knowledge, are the commodities of technocapitalism, as much as tangible raw materials, labour and capital were the commodities that underpinned industrial capitalism (Suarez-Villa, 2000, 2001). In fact, the emergence of technocapitalism has made knowledge such a valuable commodity—accounting for 75% of the value of most of the existing products and services in the world today—that material commodities now occupy secondary positions (Suarez-Villa, 2000, 2001).

The interaction between technocapitalism and science is also generating new networks for collaboration and disciplines for technological innovation—for example, biotechnology, nanotechnology, informatics and genomics. Both public and private enterprises are driven by research and innovation, which is in sharp contrast to industrial capitalism's entrepreneurs who focus more on production (Suarez-Villa, 2000). Societies that are aspiring to raise their citizens' living standards in the new era

of technocapitalism must therefore invest heavily in fostering creativity and generating knowledge (Suarez-Villa, 2000). In this regard, the role of institutions of higher learning is pivotal in educating the next generation of scientists and engineers.

However, it is important to analyse how the relationship between technocapitalism and academic institutions—the traditional homes of science and technology—is changing. During the past 50 years, universities and industry have forged closer ties—which might reflect the marked expansion in science and technology education, and the unprecedented increase in physical infrastructure such as educational facilities and research laboratories—which has given rise to the university–industrial complex (Kenney, 1998). Not surprisingly, there are growing concerns about the effects that the commercialization of university research would have on the university as an independent intellectual institution (Kenney, 1998; Press & Washburn, 2000; Oehmke, 2005).

Apart from threats to the intellectual independence of science and technology departments, there might also be deleterious effects on the humanities. The emergence of the university–industrial complex puts a price-tag on research departments based on how much industrial money they can attract, which leads to the downsizing of humanity faculties. Hunter Rawlings, former President of Cornell University (Ithaca, NY, USA), argued in a public address that the tendency to be driven by financial considerations can lead to short-sighted emphasis on research fields with commercial potential and the neglect of others (Rawlings, 2000). The humanities have been providing important insights into and serious critique of the influence of science on society; they have enlarged our worldview, and act as the keepers and conveyors of culture in a democratic society. Since Socrates, the humanities have been catalysts for social change, providing society with a critical spirit and arguments (Rawlings, 2000); their loss would come at great cost to global society and thus to universities themselves.

Despite the rise of technocapitalism's university–industrial complex, it could be argued that the university has outlived its traditional role as the guardian of national culture (Readings, 1998). The rise of technocapitalism is a compulsory response to the evolution of capitalism as the engine of progress in modern society (Nelson, 1990). Unless there is a reversal in the trend of declining public funding to academic institutions, the future of research universities will be intimately linked to changes in capitalism.

REFERENCES

- Kenney M (1998) Biotechnology and the creation of a new economic space. In *Private Science: Biotechnology and the Rise of Molecular Sciences*, A Thackray (ed). Philadelphia, PA, USA: University of Pennsylvania
- Nelson RR (1990) Capitalism as an engine of progress. *Research Policy* **19**: 193–214
- Oehmke JF (2005) Commerce and freedom of inquiry. *EMBO Rep* **6**: 3–7
- Press E, Washburn J (2000) The kept university. *Atl Mon* **285**: 39–54
- Rawlings HR (2000) *The Role of Humanities in a Research University*. Ithaca, NY, USA: Cornell University
- Readings B (1998) *The University in Ruins*. Cambridge, MA, USA: Harvard University Press
- Suarez-Villa L (2000) *Invention and the Rise of Technocapitalism*. Lanham, MD, USA: Rowman & Littlefield
- Suarez-Villa L (2001) The rise of technocapitalism. *Sci Stud* **14**: 4–20
- Suarez-Villa L (2003) The E-economy and the rise of technocapitalism: networks, firms and transportation. *Growth Change* **34**: 390–414
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Drp1 phosphorylation
and mitochondrial
regulation

A paper by Cribbs & Strack (2007) in a recent issue of *EMBO Reports*, as well as an earlier study published by our group (Chang & Blackstone, 2007),