

**A revival of parabiosis in biomedical research.**

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**Public Summary:**

Modern medicine wields the power to treat large numbers of diseases and injuries most of us would have died from just a hundred years ago, yet many of the most devastating diseases of our time are still untreatable. Chronic conditions of age such as cardiovascular disease, diabetes, osteoarthritis or Alzheimer's disease turn out to be of a complexity that may require transformative ideas and paradigms to understand and treat them. Parabiosis, which is characterised by a shared blood supply between two surgically connected animals, may just provide such a transformative experimental paradigm. Although forgotten and shunned now in many countries, it has contributed to major breakthroughs in tumour biology, endocrinology and transplantation research in the past century. Interestingly, recent studies from the United States and Britain are reporting stunning advances in stem cell biology and tissue regeneration using parabiosis between young and old mice, indicating a possible revival of this paradigm. We review here briefly the history of parabiosis and discuss its utility to study physiological and pathophysiological processes. We argue that parabiosis is a technique that should enjoy wider acceptance and application, and that policies should be revisited to allow its use in biomedical research.

**Scientific Abstract:**

Modern medicine wields the power to treat large numbers of diseases and injuries most of us would have died from just a hundred years ago, yet many of the most devastating diseases of our time are still untreatable. Chronic conditions of age such as cardiovascular disease, diabetes, osteoarthritis or Alzheimer's disease turn out to be of a complexity that may require transformative ideas and paradigms to understand and treat them. Parabiosis, which is characterised by a shared blood supply between two surgically connected animals, may just provide such a transformative experimental paradigm. Although forgotten and shunned now in many countries, it has contributed to major breakthroughs in tumour biology, endocrinology and transplantation research in the past century. Interestingly, recent studies from the United States and Britain are reporting stunning advances in stem cell biology and tissue regeneration using parabiosis between young and old mice, indicating a possible revival of this paradigm. We review here briefly the history of parabiosis and discuss its utility to study physiological and pathophysiological processes. We argue that parabiosis is a technique that should enjoy wider acceptance and application, and that policies should be revisited to allow its use in biomedical research.

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