In the news

RESTRICTIONS ON FETAL TISSUE RESEARCH

The US Department of Health and Human Services (HHS) has announced that the Trump administration is halting fetal tissue research conducted by government scientists at the National Institutes of Health (NIH) ([Statement from the Department of Health and Human Services](#), 5 Jun 2019). Although university-led research projects funded by the US government that involve fetal tissues will not be affected and the research can continue until the funding expires, new restrictions have been put in place for new grant applications or renewal applications for academic researchers that seek funding from the NIH for projects that involve the use of fetal tissues from elective abortions, and an ethics advisory board will review the proposals and recommend whether to fund any future projects ([Nature](#), 5 Jun 2019; [Science](#), 5 Jun 2019).

In 2018, the HHS initiated a review “of all HHS research involving human fetal tissue from elective abortions to ensure consistency with statutes and regulations governing such research, and to ensure the adequacy of procedures and oversight of this research in light of the serious regulatory, moral, and ethical considerations involved.” The government now announced that it will end funding of medical research by government scientists using fetal tissue and will not extend its contract with a research laboratory at the University of California, San Francisco (UCSF) ([The New York Times](#), 5 Jun 2019). In a response to the administration’s actions on fetal tissue research, UCSF Chancellor Sam Hawgood says that UCSF strongly opposes the decision and that the “action ends a 30-year partnership with the NIH to use specially designed models that could be developed only through the use of fetal tissue to find a cure for HIV” ([UCSF](#), 5 Jun 2019).

The decision is a major blow to basic and translational research. Many projects from across a broad range of research areas, including neuroscience, stem cell research, developmental biology and microbiology, depend on fetal tissue. Fetal tissues have been vitally important for studies of complex diseases and conditions such as Alzheimer disease and cancer, human development, as well as studies on HIV and Zika virus and for drug and vaccine development ([Nature](#), 6 Jan 2016). The use of fetal tissues has always been controversial. In December 2018, the NIH announced it would award US\$20 million in grants to support the development of alternative methods ([NIH](#), 10 Dec 2019); however, currently available alternative systems (for example, organoids or animal models) are often not suitable for a particular condition or disease being studied or for investigating human development. Fetal tissues have been instrumental, for example, for the study of HIV pathogenesis and treatment using humanized mouse models ([Current Opinion in Virology](#), 2015) or transmission of Zika virus from mother to baby through the placenta or linking Zika virus infection to the development of microcephaly ([Nature](#), 1 Jan 2016), and scientists have a clear message emphasizing that currently no alternatives to human fetal tissue have been shown to be as powerful.

Andrea Du Toit

BACTERIAL PHYSIOLOGY

E. coli takes every hurdle in stride

Chemotaxis enables bacteria to move towards a chemical attractant, such as a nutrient. To achieve this, the bacteria sense the attractant gradient and adjust their movement accordingly. So far, little is known about bacterial chemotaxis if it occurs in an environment with obstacles. Surprisingly, Rashid et al. now find that chemotaxis of *Escherichia coli* is as efficient (that is, as fast) in the presence of obstacles as it is when the path is clear.

E. coli has several flagella that all rotate together and thereby enable the bacterium to swim forward. When the flagella switch their direction of rotation, the bacterium tumbles, reorients itself and then again swims forward, although in a new direction. When chemotaxing, the bacterium reduces the frequency of tumbles as it swims towards the attractant. Rashid et al. now tested this behaviour

in microfluidic devices with varying numbers and shapes of evenly spaced obstacles covering up to 64% of the whole chamber area (this still left enough space for the bacteria to swim between the obstacles).

Based on computer simulations using established chemotaxis models, the authors predicted that obstacles would hinder chemotaxis. By contrast, in the actual experiments, *E. coli* swam towards a nutrient source with almost the same efficiency irrespective of the number of obstacles; in fact, the bacteria were able to leave the chambers with the same speed at the maximum number of obstacles as when there were none. The shape of the obstacles also had no effect.

To account for this unexpected result, the authors adjusted their existing model and found that the model fit improved when the cells

MICROBIOME

Country-living in the city

Asthma is the most common chronic disease in children and multiple factors have been indicated in the development of asthma, including environmental and host factors. Whereas populations in rural areas have a low risk of asthma, populations in urban environments have a high risk. Indeed, urbanization has been linked to the increased risk of developing asthma and previous studies have suggested that exposure to farms with animals, in particular increased environmental microbial burden and exposure to farm-associated microbial communities in house dust, seems to protect children from childhood asthma. Despite the increasing available evidence of an asthma-protective effect of farm-like indoor dust microbiota, whether similar communities in urban environments have a protective effect was unclear. In this study, Kirjavainen et al. show that the

microbiota associated with farm houses also has a protective effect in non-farm houses as the risk of developing asthma decreases.

First, the authors characterized the microbiome from homes at farms with animals and non-farm rural homes of Finnish children and found that microbial composition in farm homes was distinct from that in non-farm homes. The farm

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