

Should mice and men ever look alike?

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There's a new acronym in town: ACHM, which stands for "animals containing human material". With any luck, you're going to be hearing a lot about it over the next few months.

We already have sheep and goats that manufacture human proteins. Research into pigs bred to carry human genes also offers new possibilities for organ transplants. And Chinese scientists have created goats containing human stem cells. So, what are the ethics of going a bit further and producing mice with human skin, say, to research skin disorders? Or giving a primate enough human neurons for it to begin to think in human ways?

Such ideas provoke an initial reaction of disgust, which is a hard-wired response to the "unnatural". Can you get past this and examine the questions rationally? Let's hope so, because scientists want to know what you think. In late July, the UK's Academy of Medical Sciences issued a report on the state of the art, the likely future developments in ACHM and its attendant ethical dilemmas. It is the first report of its kind anywhere in the world, and aims to start a discussion among scientists, ethicists and, most importantly, the public.

British science has a good track record of allowing public opinion to set limits on research. In the 1990s, under the leadership of the government's then chief scientific adviser, Robert May, scientists simply laid out the arguments and left politicians to take in public opinion, before voting on regulation. The result was everything that British science had hoped for. It was a different story in the US, where scientists lobbied hard for permission to work with embryonic stem cells but ended up being denied by legislation borne on a tide of public suspicion.

The new ACHM report lays out exactly the areas that make scientists feel uncomfortable: having animals' brains work too much like a human being's, for example, or doing anything that might give an animal human eggs or sperm (and thus pave the way for chimeral offspring).

Another area of discomfort is more subtle. No one feels happy about making a crea-

ture that might display human-like features: if it looks or talks in any way like a human, we've probably gone too far, scientists say.

It's good to talk

That is only their initial disgust response. Will it fade away when we've become used to seeing such features on creatures that bring us cures for Alzheimer's and Parkinson's disease? Or when the animal provides a liver for a sick child?

Human-like genes in mice are already being used to generate antibodies for treating cancers and immune system disorders. Are we sure we don't want to take this aspect of medicine to the next level?

It's worth remembering that scientists have sometimes been more conservative than the public has wanted them to be. The scientific establishment was strongly opposed to embarking on a programme of human in vitro fertilisation (IVF) in the early 1970s. Spurred on by enthusiastic public support, Patrick Steptoe and Robert Edwards garnered private funding and pressed on. More than four million people who are alive today thanks to IVF are grateful they did.

Not that this precedent suggests we should blindly usher in the age of ACHM. It is time, however, to start talking about what it might be like.