Future Rodent Control Technologies

Opportunities for using novel genetic control tools for the humane control of overabundant vertebrate pest populations

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Novel revolutionary genetic technologies have recently been developed that can force modified genetic traits into an animal population, defying the constraints of normal Mendelian inheritance. A highly specific gene editing system drives the duplication of a specific gene cassette between paternal and maternal chromosomes so that the trait is inherited by all offspring. There is currently very active global debate about the potential applications of this exciting new technology, including novel strategies to humanely control overabundant invasive pest animal populations. Delivered and spread through sexual reproduction the potential of this powerful new technology is unprecedented, making pest eradication theoretically feasible. At present, such technologies have only been shown to function in insects, but work in mice as a mammalian model system is currently underway. Much of the international debate focuses on the risks that might be posed by the technology, how they can be mitigated, how they should be regulated and even whether they can be used at all. The ability to safely control any putative genetic control approaches is paramount, to ensure protection of the target animal in its native distribution range. For any experimental research into genetic control tools it is essential to understand the risks, potential ecological and social implications, to develop physical, genetic and ecological containment measures as well as robust regulatory pathways. In Australia, a world leader in the biological control of invasive species, extensive consultations are currently bringing together key stakeholders. These groups cover a broad range of interests and include scientists from key disciplines, government regulators and public representatives. It is critical to ensure a transparent and informed debate from the outset, responsible conduct of science, and to identify key pathways and barriers to adoption of any putative genetic control tools.

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