



## Private prescription:

A thought-provoking tonic on the lighter side

Column by Raymond C. Rowe, AstraZeneca, UK

Please note that these are the personal opinions of the author and do not necessarily represent those of AstraZeneca.

# Rat of the month

I do not like rats. That is not to say that I loathe them; it is just that I prefer them to be behind bars in a cage. Having worked on farms in my youth, and having them jump out at me as I have removed bales of hay in barns, has influenced my view of them. However, as a scientist, I do recognize their usefulness in research.

### Rats

Whenever I hear the word 'rats' I always associate it with the second stanza of that famous poem *The Pied Piper of Hamelin* written by Robert Browning in the mid-nineteenth century:

Rats!

They fought the dogs and killed  
the cats,  
And bit the babies in their cradles,  
And ate the cheeses out of the vats,  
And licked the soup from the cooks  
own ladles,  
Split open the kegs of salted sprats,  
Made nests inside men's Sunday  
hats,  
And even spoiled the women's chats  
By drowning their speaking  
With shrieking and squeaking  
In fifty different sharps and flats.

Incidentally, this poem was written for a young boy called Willie, the son of a

William Macready who was an actor and theatre manager known to Browning. Willie had a talent for drawing, and Browning wrote the poem for the boy to illustrate while he was at home ill with a bad cough [1]. Of course, Browning has used poetic licence, but the poem is accurate with respect to many of the known characteristics of the species; their aggression, especially when cornered, their catholic choice of food and their ability to climb, jump and gnaw, enabling them to infest places inaccessible to other small mammals.

### 'A unique laboRATory resource'

Ordinarily, 'rat' refers to either the black rat (*Rattus rattus*) or the brown or Norway rat (*Rattus norvegicus*). The latter is the most common in Europe and North America. It has adapted to a temperate climate and inhabits the majority of large human communities. The black rat occurs mainly in the port areas of Europe but is common inland in warmer regions such as India. It is smaller than the brown rat and does not burrow. Both species can reproduce throughout the year; females are continually poly-oestrous, with a cycle of 4–6 days and gestation of 3 weeks. With a litter size of between six and 14 pups, and six

litters per year, the population can increase dramatically, if conditions are favourable.

The rat first entered captivity in the early nineteenth century as a consequence of collecting large numbers from the wild for rat-baiting. Rat breeding as a hobby occurred later in the century, as did breeding for scientific purposes. However, almost all modern strains of rats used in research originated from an outbred commercial colony established at the Wistar Institute (<http://www.wistar.upenn.edu/>) in Philadelphia in 1906. The Wistar bloodline has contributed to more strains of rat than any other single line. Sprague–Dawley rats originated from Wistar females crossed with a hybrid male of unknown origin, and Long–Evans rats are believed to have originated from Wistar females crossed with a wild male Norway rat.

### Lab rats

Use of the laboratory rat has grown steadily over the years as its size enables scientists to perform many procedures that are difficult to accomplish on smaller mammals. The rat can also be trained to undertake complex tasks – a useful attribute in research into cognition and memory. I am sure many readers will have heard of the joke:

Question:

What did one lab rat say to the other?

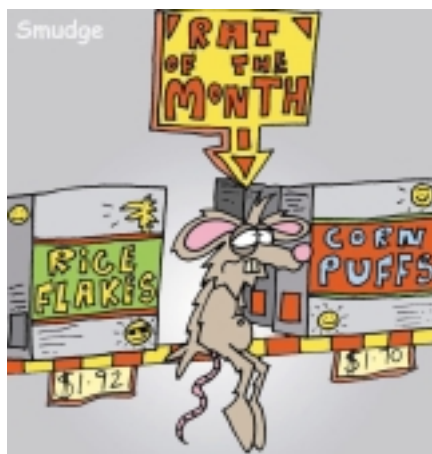
Answer:

I've got my scientist so well trained  
that every time I push the buzzer,  
he brings me a snack!

In fact, rat models provide more physiological data than perhaps any other experimental animal, so much so that Judith Va itukaitis, Director of The National Centre for Research Resources (NCRR; <http://www.ncrr.nih.gov>), part of the National Institutes of Health (NIH; <http://www.nih.gov/>) in the USA, has been quoted as saying:

'Rats serve as very important animal models of many human diseases and conditions and are one of the most important experimental animals in studies related to understanding physiological processes and health concerns in humans. Almost any organ system in humans can be studied using specific rat strains or mutants [2]'.

Few would disagree with this statement, but unless you are a member of a relatively large organization it is often difficult for researchers to obtain the specific strain they require for their research. Commercial repositories tend to stock only the standard strains, and the few non-commercial sources cannot handle the demand. In addition, scientists who have managed to develop unusual strains generally lack the facilities to supply others. Consequently, in 1999, the NIH brought together a panel of scientists to find a solution. The result was the establishment in January this year (2002) of the Rat Resource and Research Centre (RRRC; <http://www.radil.missouri.edu/rrrc>) at



the University of Missouri (<http://www.missouri.edu/>).

Set up with a US\$ 6.7 million grant, the RRRC comprises researchers from the University of Missouri, Harlan Sprague Dawley (<http://www.harlan.com>), Northwestern University (<http://www.northwestern.edu/>) and Indiana State University (<http://www.indstate.edu/>), with the aim of establishing a centre for the distribution of high quality, well-characterized, inbred, hybrid and mutant rats to investigators. To this end, the centre will select and import strains, re-derive them to a

pathogen-free state, and cryopreserve the gametes and embryos. It also aims to perform genotyping, phenotyping and infectious disease monitoring. Rats will be distributed to investigators either alive or as cryopreserved germplasm or tissues.

### Rats on the Internet

An interesting feature of the RRRC is that access is via the Internet, and all orders and donations can be carried out via e-mail, just as easily as buying a book over the Internet. Perhaps we will soon see 'Rat of the month', 'Best selling rat' and even 'Connoisseur's collections', all with their genomes sequenced and browsable by rat aficionados throughout the world – a unique laborATory resource!

### References

- 1 McDonald, T. (2000) *Trevor McDonald's World of Poetry*, Andre Deutsch Classics, London, UK
- 2 Vaitukaitis, J. (2002) *NIH News Release*, January 28, National Institutes of Health, Bethesda, MD, USA

**Raymond C. Rowe**

Pharmaceutical and Analytical R&D  
AstraZeneca, Alderley Park  
Macclesfield, Cheshire, UK SK10 2NA  
e-mail: [Ray.Rowe@astrazeneca.com](mailto:Ray.Rowe@astrazeneca.com)

## Want to get your voice heard?

Here is an unrivalled opportunity to put your view forward to some of the key scientists and business leaders in the field

Letters can cover any topic relating to the pharma industry – comments, replies to previous letters, practical problems...

Also, the opportunity to get off your chest those things that really irritate you!

...and to be able to tell the relevant people what really irritates you without them knowing it is you!

Please send all contributions to Dr Joanna Owens  
e-mail: [joanna.owens@elsevier.com](mailto:joanna.owens@elsevier.com)

Publication of letters is subject to editorial discretion