Rodenticide resistance: Will you help fill the gaps?

Resistance is everywhere! Or is it? Clare Jones and Montse Talavera from the Vertebrate Pests Unit at the University of Reading need your help to find out! What's more if you live in an area of the UK where they have insufficient data you can get sophisticated DNA analysis done for the price of a postage stamp meaning you will get the results you need to be sure what you are dealing with, as Clare and Montse explain.

Reading University's Vertebrate Pest Unit (VPU) is using DNA analysis of tail samples to map the presence and absence of resistance mutations in Norway rats and house mice – see maps below of results so far.

Across the UK there are five major mutations in Norway rats and two in house mice. Each mutation confers resistance to different anticoagulants and this makes controlling these populations difficult. It is important to know which mutations you have so you can use the most effective rodenticides to get the job done as quickly as possible whilst, at the same time, avoid releasing unnecessary toxicants into the wider environment.

Unfortunately we still have large areas of the UK where we have very few or no samples at all. Is this because there is no resistance and pest professionals are not having difficulties in controlling rats and mice in these areas? Or is it simply because we are not attracting enough involvement in the project?

The Rodenticide Resistance Action Committee (RRAC) is funding the anticoagulant resistance project so all you need to do if you work in an area where we have no data is send samples to use here at the VPU at Reading University. We will DNA test each tail and send the results directly to you. All free of charge!

Table 1 lists the English counties where we do not have any samples. If you live or work in any of .these places we want your tail samples

Data for Scotland and Wales is very thin on the ground such that it is easier to list the counties/districts where we already have

Resistance mutations for Norway rats

VKORC1 mutations in the Norway rat

Susceptible	L120Q	Y139F	Y139C	L128Q	Y139S	L120Q &L128Q
Homozygous	Heterozygous	Heterozygous	Heterozygous	Heterozygous	Heterozygous	Heterozygous
	Homozygous	Homozygous	Homozygous	Homozygous	Homozygous	

Resistance mutations for house mice

VKORC1 mutations in the house mouse

Susceptible	Y139C	L128S	L128S & Y139C
Homozygous	Heterozygous	Heterozygous	Heterozygous
	Homozygous	Homozygous	Homozygous

samples, see table 2. If you work anywhere else in Scotland or Wales then please get involved. There is no data for Northern Ireland so, again, please send us your samples.

By doing so you will be providing us with essential information that will allow us to not only understand the spread of resistance, but also help us provide advice on which products will work for you in your area.

Table 1: England

Tail samples from the following districts/counties are virtually guaranteed to be free as data is lacking.

North West:	Blackburn with Darwen
	Cumbria
	Halton
	Merseyside
	Warrington
North East & Yorkshire:	East Riding of Yorkshire
	Darlington
	Hartlepool
	Middlesbrough
	Northumberland
	Redcar & Cleveland
	South Yorkshire
	Stockton on Tees
West Midlands:	South Gloucestershire
	Telford & Wrekin
	Warwickshire
East Midlands:	Derbyshire
	Leicestershire
	Lincolnshire
	North East Lincolnshire
	North Lincolnshire
	Nottinghamshire
	Rutland
Eastern England:	Bedfordshire
	Milton Keynes
	Luton
	Peterborough
	Southend on Sea
	Thurrock
South West:	Bath & North East Somerset
	Bournemouth
	Cornwall
	North Somerset
	Poole
	Torbay
South East:	Brighton & Hove

Table 2: Scotland and Wales

Data is lacking for nearly all of Scotland and a good deal of Wales. The **districts/counties with some data** are listed below; anywhere else and free testing is virtually guaranteed.

Scotland:	City of Edinburgh
Wales:	Camarthenshire
	Monmothshire
	Pembrokeshire
	Powys
	Wrexham

How to get your FREE test

Think you've got some suitable sites? **BEFORE** you do anything, email the Vertebrate Pests Unit (clare.jones@reading.ac.uk) with the post codes of the sites you want to collect tails from. We will tell you whether you are already near an existing data point and will be happy to give you advice.

Collect between one and three tails per site - see how below. If a tail fails testing you will be invited to send up to a maximum of three replacement tails.

Collect tails from dead bodies and, preferably, from trapped rodents. Fresh, clean and intact bodies are needed for tests to work. If you suspect a body is more than three days old and is not of good quality, do not use it.

Three easy steps:

1 Cut

- A tail tip (2-3 cm) is required to provide DNA from each rodent. Each tail tip must be removed using a clean blade or sturdy scissors.

2 Bag

- Tails should be stored in a sealable plastic bag (e.g. Zip-Lok);
- Please put each tail in a separate bag;
- Use our template as a guide for labelling your bagged tails:

  Name: [Your name]
  Date: [Date the tail was collected]
  Species: [Norway rat / House mouse]
  Site Postcode: [Postcode of the site or GPS co-ordinates]
  Email: [Your personal or work email]

3 Post

- Once the tail sample has been placed in a bag, it should be sent to the University of Reading for DNA testing OR if you can't post it the same day put the tail in a freezer (within 12 hrs of collection) until it can be posted;
- An exact location must be provided with a sample (GPS co-ordinates OR a post code) otherwise it cannot be processed. Please include your email address so we can contact you with the results;
- The samples must be labelled correctly and packed in a way that samples cannot be touched by unauthorised people.

Please note: If your samples are from a location within a 5km radius of an existing data point then they cannot be analysed free of charge. If you would like to check whether you are near any resistance go to RRAC's online interactive questionnaire and map: http://guide.rrac.info/resistance-maps/resistance-maps

RRAC funding is not unlimited so get involved and help us fill in the gaps now!

Visit our web page for more information: https://research.reading.ac.uk/resistant-rats/