Mini tag – a new robust identification method for modern laboratory animal practices

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Introduction

To keep up with the growing complexity of managing genetically altered animals (GAA), many facilities are looking at automated systems to maintain data integrity and efficiency in breeding and generating study cohorts. Animals are often given identification (ID) to track genotypes, which means the ID needs to be permanent and easily traceable. We have continued to look at various identification methods which help us ensure the correct animals are selected for shipment, colony management tasks and euthanasia.

Through a third-party collaboration, a mini ear tag was developed to fit our operation needs and benefit customers receiving animals. This mini ear tag has a 2D barcode and comes in an assortment of 10 colours. The current size of the mini tag (3.5mm) enables us to identify a mouse as young as 14 days old. The mini tag has been trialled successfully in wildtype, genetically altered and immunodeficient mouse strains in the United States (USA) and United Kingdom (UK).

We have incorporated the scannable barcode functionality into our current colony management system and the various colours provide the technicians with a secondary method of identification, helping to efficiently identify the correct animal. Integrating this mini tag into our colony management system has reduced errors and increased efficiency for our technicians. Charles River US have applied over 320,000 tags since rollout in 2023, with Charles River UK applying over 2500 tags since rollout in May 2024.

Design and benefits

2-D matrix barcode technology

- easy, instant scanning
- software compatible
- millions of unique codes
- reduces human error

Intuitive design

- colour-coded for rapid (visual) identification (Figure 1)
- MRI compatible

Figure 1. Colour coded.

Animal welfare

- Lightweight and small (3.5mm) (Figure 2).
- Polymer material reduces risk of tissue irritation.[1]

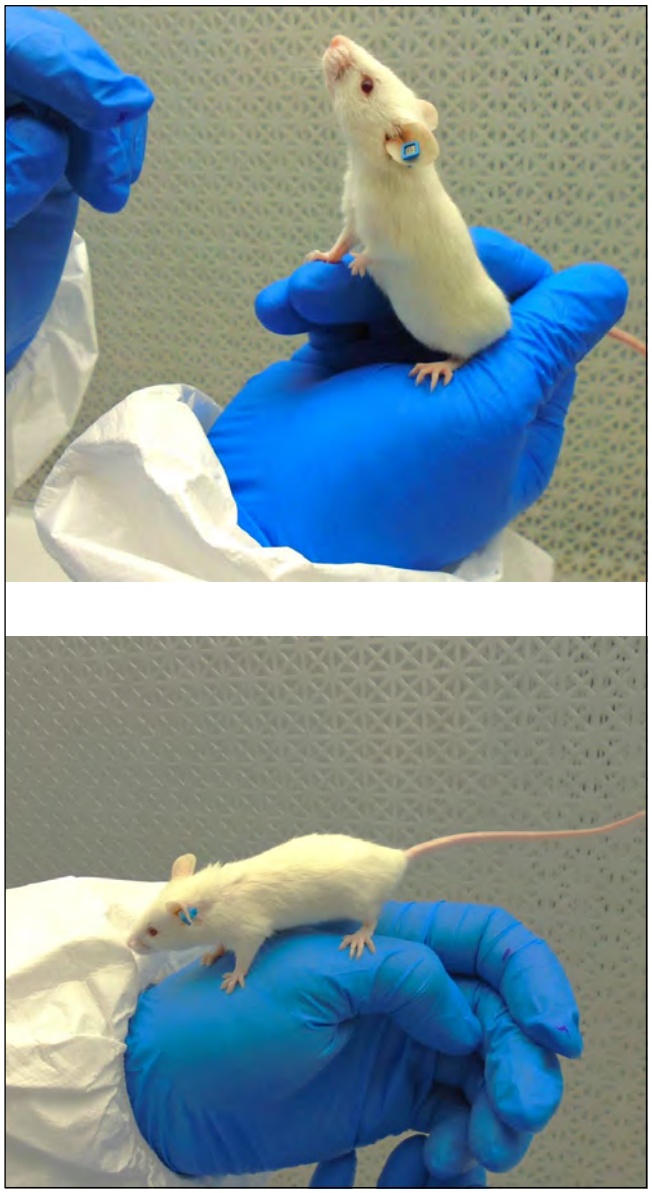

Figure 2. Mini tag.

Ear notching (Table 1)

- Easy to perform and trauma to the animal is minimal.[1]
- We use the 1-2-4-7 system due to its ability to create numbers to match internal ID generated via our internet colony management system (ICM).
- ID mark can be misidentified (due to tissue healing or variation in technique).

Microchips (Table 1)

- Size of microchips has reduced, helps to minimise stress during application.[1]
- Can be used in mice as young as 14-days-old.[2]
- Can be integrated within colony management systems.
- No visual identification possible and can dropout or migrate.

Mini tag (Table 1)

- 2D barcode with quick visual identification due to the colours the tags come in.
- Can be used in mice as young as 14-days-old.
- Can be integrated within colony management systems.
- Drop out risk reduced by correct placement of the tag and providing suitable enrichment to reduce mouse interference.

Tag application and colony management system

Figure 3. Tag applicator.

Comparison to other identification methods

	Cost	Ease of application	Easy to visually read	Risk of misidentification	Maintaining ID over time
Ear notch	+++	+++	++	+	+
Microchip	+	+	-	-	+++
Mini tag	++	+++	+++	-	+++

+ Fair, ++ Good, +++ Excellent, - N/A

Table 1.

Figure 4. Mouse restrained with tag applied in the middle of the pinna.

Figure 5. Tag scanner for ID entry into ICM.

Integration within colony management system (ICM™)

- Animal records, including the tag identity are held within ICM. Individual animal history from weaning is recorded allowing traceability (Figure 5).
- The tag is scanned before a task, e.g. breeding is done to ensure the correct mouse is selected.
- The task and tag are linked in ICM. If the technician scans the incorrect animal, they cannot proceed with the task. Only when the correct animal is found can the technician proceed with the task (Figure 6).

Future considerations – 3Rs

For 2025, Charles River UK are looking to combine the use of the mini tag with oral swabbing for genotyping. Removing the need to use ear tissues is a refinement to our genotyping practices and a less invasive sampling method moving forward.

The use of tags within rats is also under consideration.

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References

1 Report of the Federation of European Laboratory Animal Science Associations Working Group on animal identification. Dahlborn, K., Bugnon, P., Nevalainen, T., Raspa, M., Verbost, P. and Spangenberg, E. (2013). Laboratory Animals, 47(1), pp.2–11. doi: https://doi.org/10.1177/0023677124732903

2 Identification Microchip Implantation Without Anesthesia in Pre-weaned Mice. (n.d.). Available at: White Paper: Microchip Implantation Without Anesthesia in Pre-Weaned Mice - Unified Information Devices

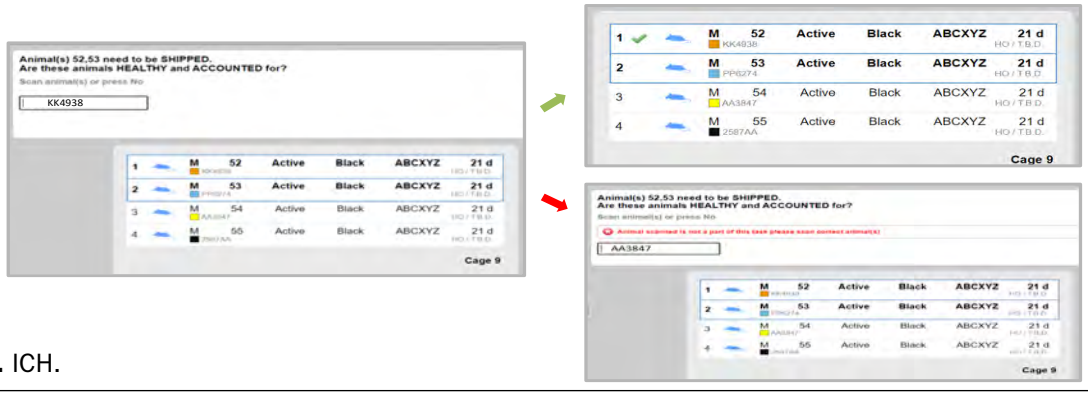

Figure 6. ICH.