

Issues Facing the Mouse Community

A User's Perspective

Ian J. Jackson

Issues Facing the Mouse Community

A UK Perspective

Ian J. Jackson

A “typical” mouse lab

ENU mutants

Radiation induced mutants

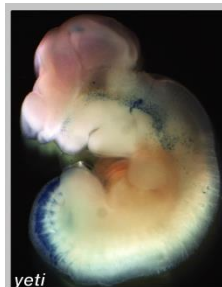
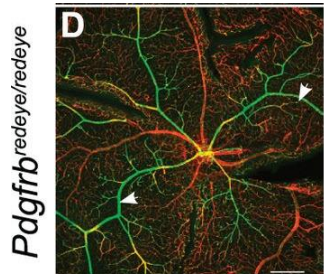
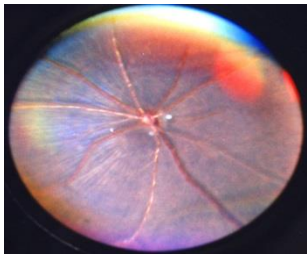
Classical mutants

transgenics

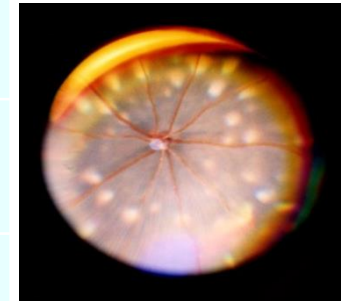
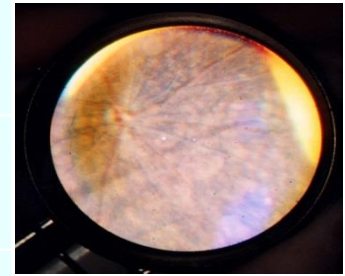
knockouts

conditionals

ENU Mutants



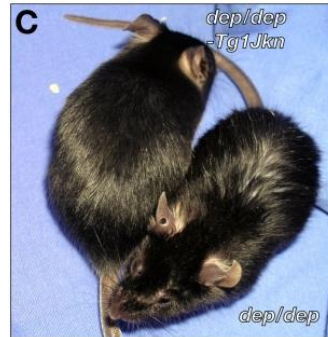
Icst	Rwhs	Tmem98 ^{M2}
Tmem98 ^{M3}	atr ^{d1}	atr ^{d2}
atr ^{d3}	Dilp1	Dilp2
Raw	Opdc	goya
redeye	dotty	perm
Goth	ginger	ceo
yeti	polyphem	kinked
mutagenesis in house		



More Mutants

Classical Mutants

bru
dep Harwell
Baylor

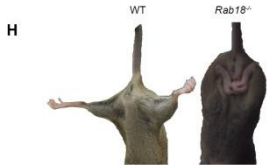


Radiation Mutants

Mp
Ie ORNL



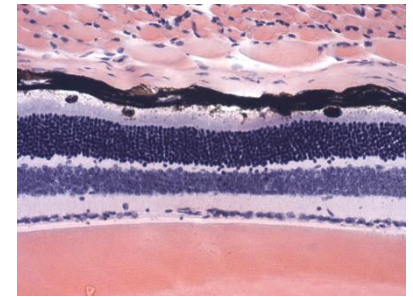
ES Cell Derived Mice



Percent survival

Rab18
Fam151b
Smoc1
Adam17
Slx4
Slc9a8
Tmem98

Harwell
Harwell
Harwell
WTSI
WTSI
WTSI
WTSI

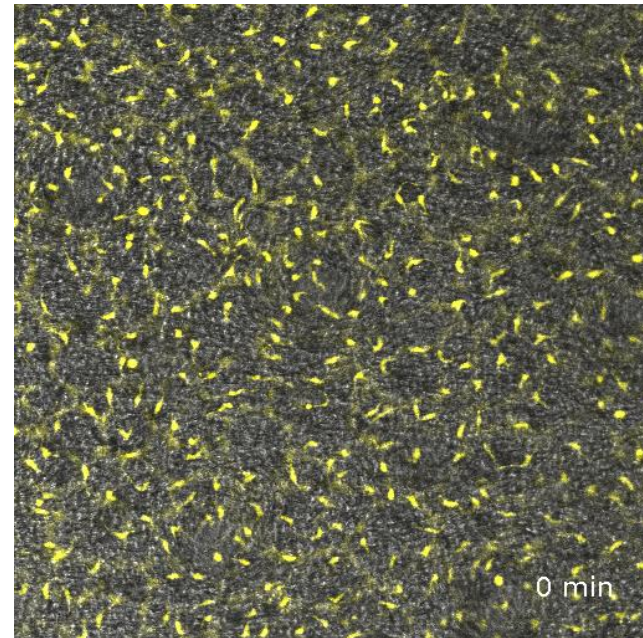


Lmx1b
RosaYFP
Ptch1
Nf1 flox
Kitl flox

McGill
Edinburgh
Harwell
NCI Frederick
South Western

Imported Reporter Mice

Tyr-Cre
Tyr-CreERT
Wnt1-Cre
Tau-GFP
Tcf/LEF-GFP
Bat-Gal



Importation

Live mice

Frozen sperm

IVF

ICSI

Frozen embryos

Ambient embryos

ES cells

Imported ES Cells

Including

Myo1d

Wdr35

Azi1

NorComm

EuComm

KOMP

+4 others

Why work on model organisms at all?



12,000 trio exomes
sequenced



100,000 genomes sequenced



500,000 individuals phenotyped
Genotyping soon, sequencing next

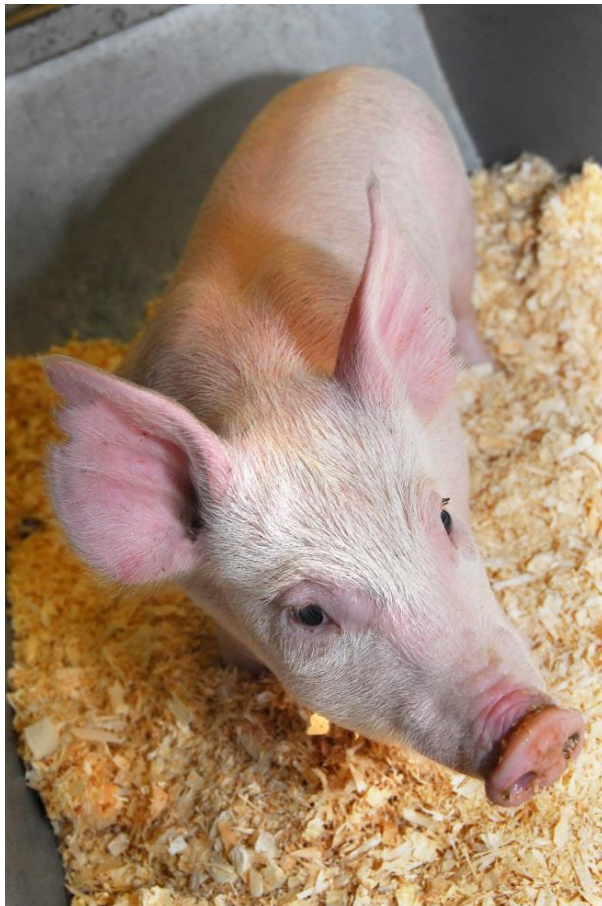
Why use a mouse model?



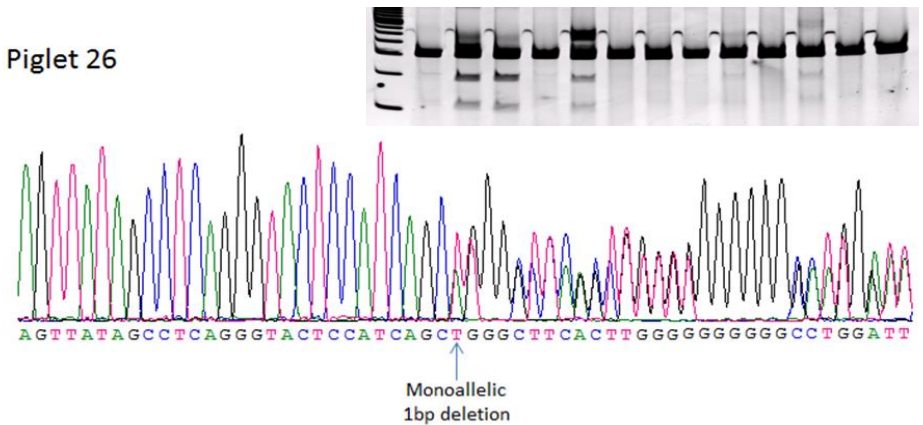
CENTRE FOR
COMPARATIVE PATHOLOGY



TALEN edited single-base deletion



Piglet 26



AGTTATAGCCTCAGGGTACTCCATCAGCATGGGCTCAGCTGTGTGGGGGGGCA (wt)
 AGTTATAGCCTCAGGGTACTCCATCAGC-TGGGCTCAGCTGTGTGGGGGGGCA (1 del)

Why Use a Repository?

Studying 2 genes mutated in human ciliopathies

Injected 3 ES cell mutant clones of each

None gave good chimaeras

None gave GLT

2-3 years

Why Use a Repository?

Studying 2 genes mutated in human ciliopathies

Made 3 CRISPR for each

Gene 1	12 mutant lines
Gene 2	5 mutant lines

<4 months

Why Use a Repository?

Will it be quicker and cheaper to make a new knockout line with CRISPR than to import an existing line from a repository?

Will engineering specific alleles be equally straightforward?

What about conditional alleles?

Public Opposition to Animal Research

**Are you donating to
charities that fund
animal experiments?**



You are, if you donate to:

Cancer Research UK

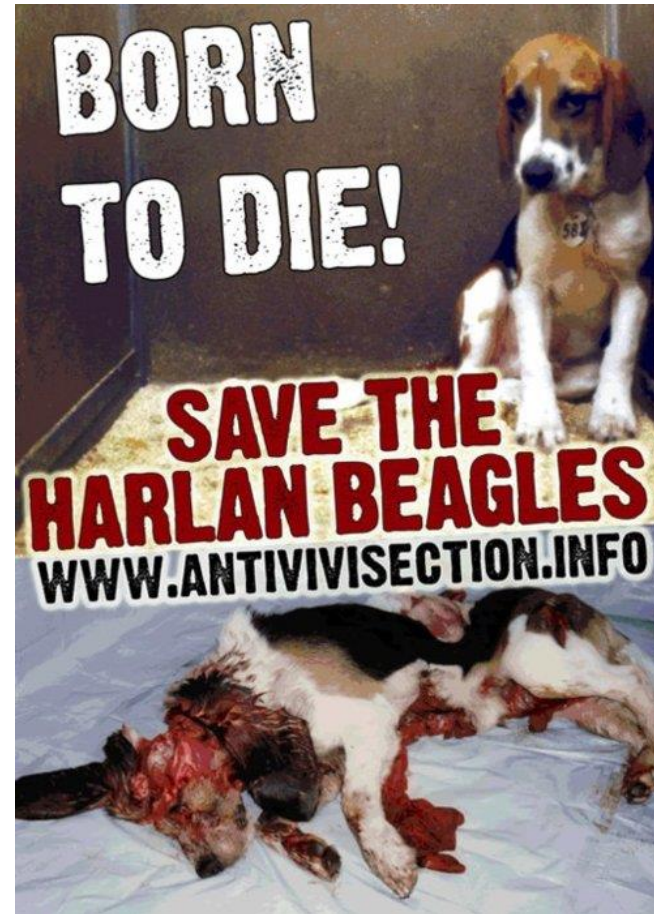
British Heart Foundation

Parkinson's UK

Alzheimer's Society



**www.boycottvivisection.com
for a full list of charities**



Live Lab Animal Transport Bans

January 2013

United Airlines stops shipments of primates

There is now not a single major airline based in North America that will deliver monkeys to laboratories.

March 2012

Last UK Ferry service bans lab animals

October 2011

Eithad declares end to all lab animals transports

October 2011

LAN ends transports of all lab animals

September 2011

Lufthansa stops transporting primates

February 2011

Amerijet creates lab animal policy ending all shipments

September 2010

El Al bans all shipments of lab animals

April 2010

Lufthansa bans shipment of cats and dogs

March 2005

British Airways bans all lab animal transport

Is it OK to only
transport embryos
and sperm?

Will there be moves
to prevent transport
of these?

Concordat on Openness on Animal Research



Develop principles of openness, practical steps and measurable objectives which will underpin a more transparent approach to animal research





From:

"Experimental Studies of the
Inheritance of Color in Mice"

C.C. Little, 1913

