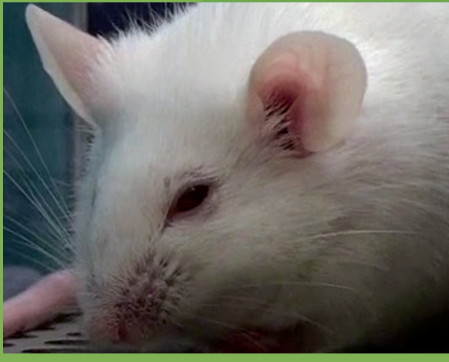
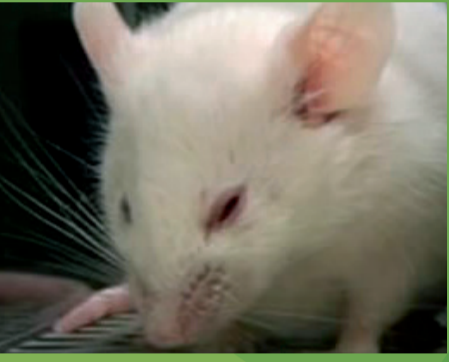
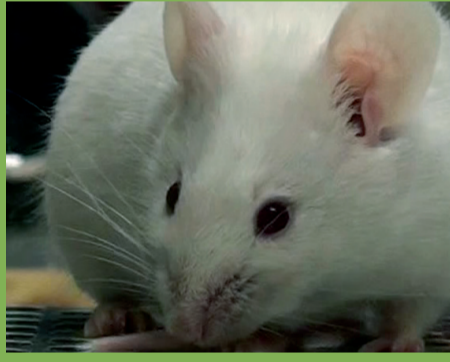







The Mouse Grimace Scale

Research has demonstrated that changes in facial expression provide a means of assessing pain in mice.

The specific facial action units shown below have been used to generate the Mouse Grimace Scale. These action units increase in intensity in response to post-procedural pain and can be used as part of a clinical assessment.

The action units should only be used in awake animals. Each animal should be observed for a short period of time to avoid scoring brief changes in facial expression that are unrelated to the animal's welfare.

	Not present "0"	Moderately present "1"	Obviously present "2"
<p>Orbital tightening</p> <ul style="list-style-type: none"> Closing of the eyelid (narrowing of orbital area) A wrinkle may be visible around the eye 			
<p>Nose bulge</p> <ul style="list-style-type: none"> Bulging on the bridge of the nose Vertical wrinkles on the side of the nose 			
<p>Cheek bulge</p> <ul style="list-style-type: none"> Bulging of the cheeks 			
<p>Ear position</p> <ul style="list-style-type: none"> Ears rotate outwards and/or backwards, away from the face Ears may fold to form a 'pointed' shape Space between the ears increases 			
<p>Whisker change</p> <ul style="list-style-type: none"> Whiskers are either pulled back against the cheek, or pulled forward to 'stand on end' Whiskers may clump together Whiskers lose their natural 'downward' curve 			

Read the original paper:
Langford DJ, Bailey AL, Chanda ML, Clarke SE, Drummond TE, Echols S, Glick S, Ingrao J, Klassen-Ross T, LaCroix-Fralish ML, Matsumiya L, Sorge RE, Sotocinal SG, Tabaka JM, Wong D, van den Maagdenberg AMJM, Ferrari MD, Craig KD, Mogil JS. 2010. Coding of facial expressions of pain in the laboratory mouse. *Nature Methods* 7(6): 447-449.
doi:10.1038/nmeth.1455


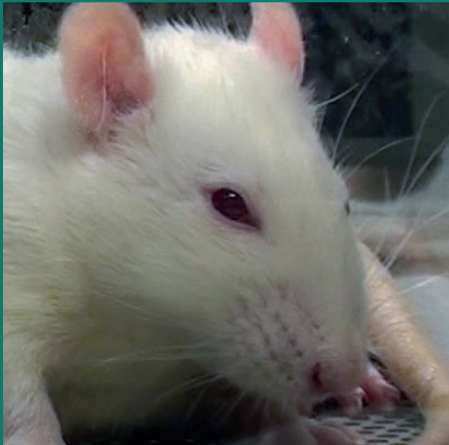
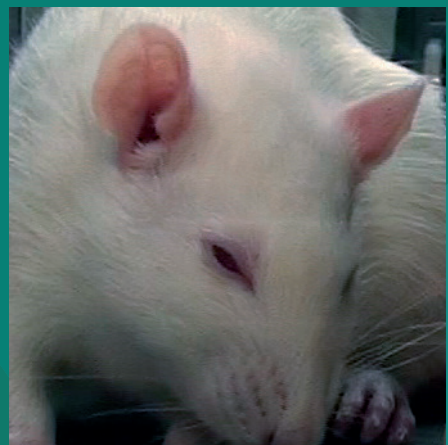
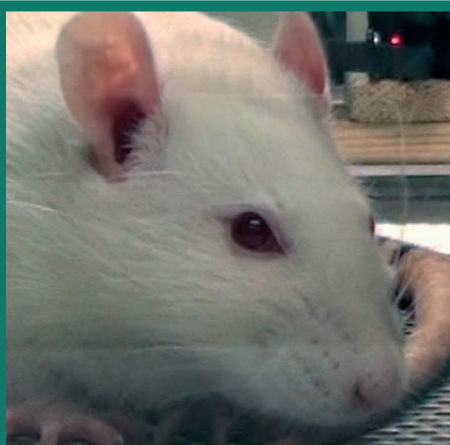
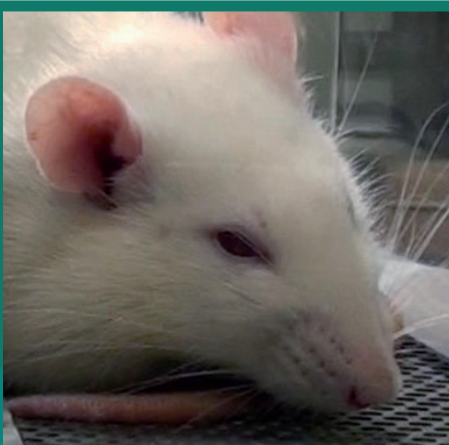
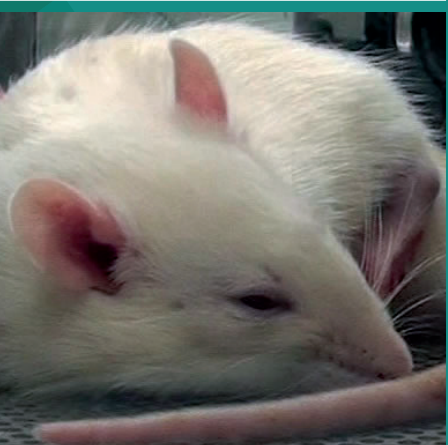
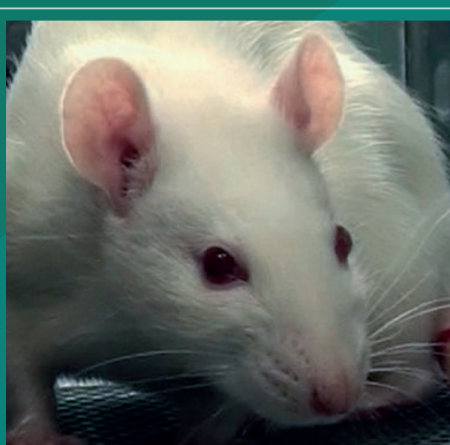



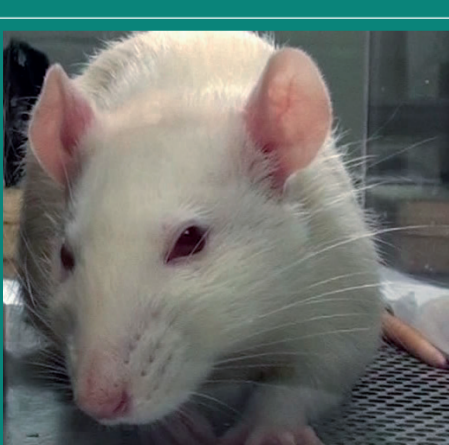

For guidance on using the Mouse Grimace Scale, research papers that underpin this technique, and for grimace scales in other species, visit: www.nc3rs.org.uk/grimacescales
To request copies of this poster, please email: enquiries@nc3rs.org.uk
The NC3Rs provides a range of 3Rs resources at: www.nc3rs.org.uk/resources
Images kindly provided by Dr Jeffrey Mogil, McGill University

The Rat Grimace Scale

Research has demonstrated that changes in facial expression provide a means of assessing pain in rats.

The specific facial action units shown below have been used to generate the Rat Grimace Scale. These action units increase in intensity in response to post-procedural pain and can be used as part of a clinical assessment.

The action units should only be used in awake animals. Each animal should be observed for a short period of time to avoid scoring brief changes in facial expression that are unrelated to the animal's welfare.

	Not present "0"	Moderately present "1"	Obviously present "2"
<p>Orbital tightening</p> <ul style="list-style-type: none"> Closing of the eyelid (narrowing of orbital area) A wrinkle may be visible around the eye 			
<p>Nose/cheek flattening</p> <ul style="list-style-type: none"> Flattening and elongation of the bridge of the nose Flattening of the cheeks (potentially sunken look) 			
<p>Ear changes</p> <ul style="list-style-type: none"> Ears curl inwards and are angled forward to form a 'pointed' shape Space between the ears increases 			
<p>Whisker change</p> <ul style="list-style-type: none"> Whiskers stiffen and angle along the face Whiskers may 'clump' together Whiskers lose their natural 'downward' curve 			

Read the original paper:
Sotocinal SG, Sorge RE, Zaloum A, Tuttle AH, Martin LJ, Wieskopf JS, Mapplebeck JCS, Wei P, Zhan S, Zhang S, McDougall JJ, King OD, Mogil JS. 2011. The Rat Grimace Scale: a partially automated method for quantifying pain in the laboratory rat via facial expressions. *Molecular Pain* 7: 55. doi:10.1186/1744-8069-7-55

For guidance on using the Rat Grimace Scale, research papers that underpin this technique, and for grimace scales in other species, visit: www.nc3rs.org.uk/grimacescales
To request copies of this poster, please email: enquiries@nc3rs.org.uk
The NC3Rs provides a range of 3Rs resources at: www.nc3rs.org.uk/resources

Images kindly provided by Dr Jeffrey Mogil, McGill University

The Rabbit Grimace Scale

Research has demonstrated that changes in facial expression provide a means of assessing pain in rabbits.

The specific facial action units shown below comprise the Rabbit Grimace Scale. These action units increase in intensity in response to post-procedural pain and can form part of a clinical assessment alongside other validated indices of pain.

The action units should only be used in awake animals. Each animal should be observed for a short period of time to avoid scoring brief changes in facial expression that are unrelated to the animal's welfare.

	Action units		
	Not present "0"	Moderately present "1"	Obviously present "2"
<p>Orbital tightening</p> <ul style="list-style-type: none"> Closing of the eyelid (narrowing of orbital area) A wrinkle may be visible around the eye 			
<p>Cheek flattening</p> <ul style="list-style-type: none"> Flattening of the cheeks. When 'obviously present', cheeks have a sunken look. The face becomes more angular and less rounded 			
<p>Nostril shape</p> <ul style="list-style-type: none"> Nostrils (nares) are drawn vertically forming a 'V' rather than 'U' shape Nose tip is moved down towards the chin 			
<p>Whisker shape and position</p> <ul style="list-style-type: none"> Whiskers are pushed away from the face to 'stand on end' Whiskers stiffen and lose their natural, downward curve Whiskers increasingly point in the same direction. When 'obviously present', whiskers move downwards 			
<p>Ear shape and position</p> <ul style="list-style-type: none"> Ears become more tightly folded / curled (more cylindrical) in shape Ears rotate from facing towards the source of sound to facing towards the hindquarters Ears may be held closer to the back or sides of the body 			

Read the original paper: Keating SCJ, Thomas AA, Flecknell PA, Leach MC (2012) Evaluation of EMLA cream for preventing pain during tattooing of rabbits: Changes in physiological, behavioural and facial expression responses. PLOS ONE 7(9): e44437. doi:10.1371/journal.pone.0044437

For guidance on using the Rabbit Grimace Scale, additional images of each action unit, research papers that underpin this technique, and for grimace scales in other species, visit: www.nc3rs.org.uk/grimacescales

To request copies of this poster, please email: enquiries@nc3rs.org.uk
The NC3Rs provides a range of 3Rs resources at www.nc3rs.org.uk/resources

Images kindly provided by Dr Matthew Leach, Newcastle University

The Rabbit Grimace Scale would not have been developed without the continuing work of the Pain and Animal Welfare Sciences Group (PAWS) at Newcastle University