PCF

The Work of a Colony Manager and Its Importance for The Scientist

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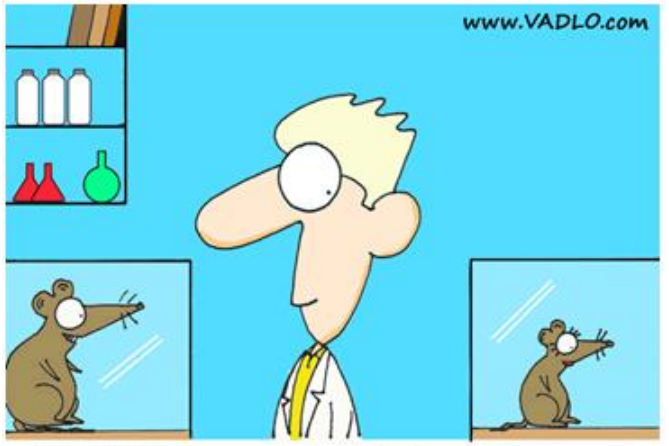
Colony Management at ISTA



"When are you setting up the breeding?"

- 12 scientific groups
  - About 17 000 living animals
- Coordination between scientist and animal caretaker
- Contact for questions, problems and requests
  - Ordering mice
  - Help with colony management database
  - Discussing new lines / crosses
- Management and organization of mouse lines
  - Import and Export of mouse lines
  - Rederivation and in vitro fertilization
  - Setting up breeding pairs and keeping the colony efficient
  - Genotyping

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What do you need for a good management?

- A good organized colony management software
- Trained animal caretaker and colony manager
- Organized animal rooms and house rules
- A good equipped genotyping laboratory

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Colony Management Software – A tune (tick@lab)

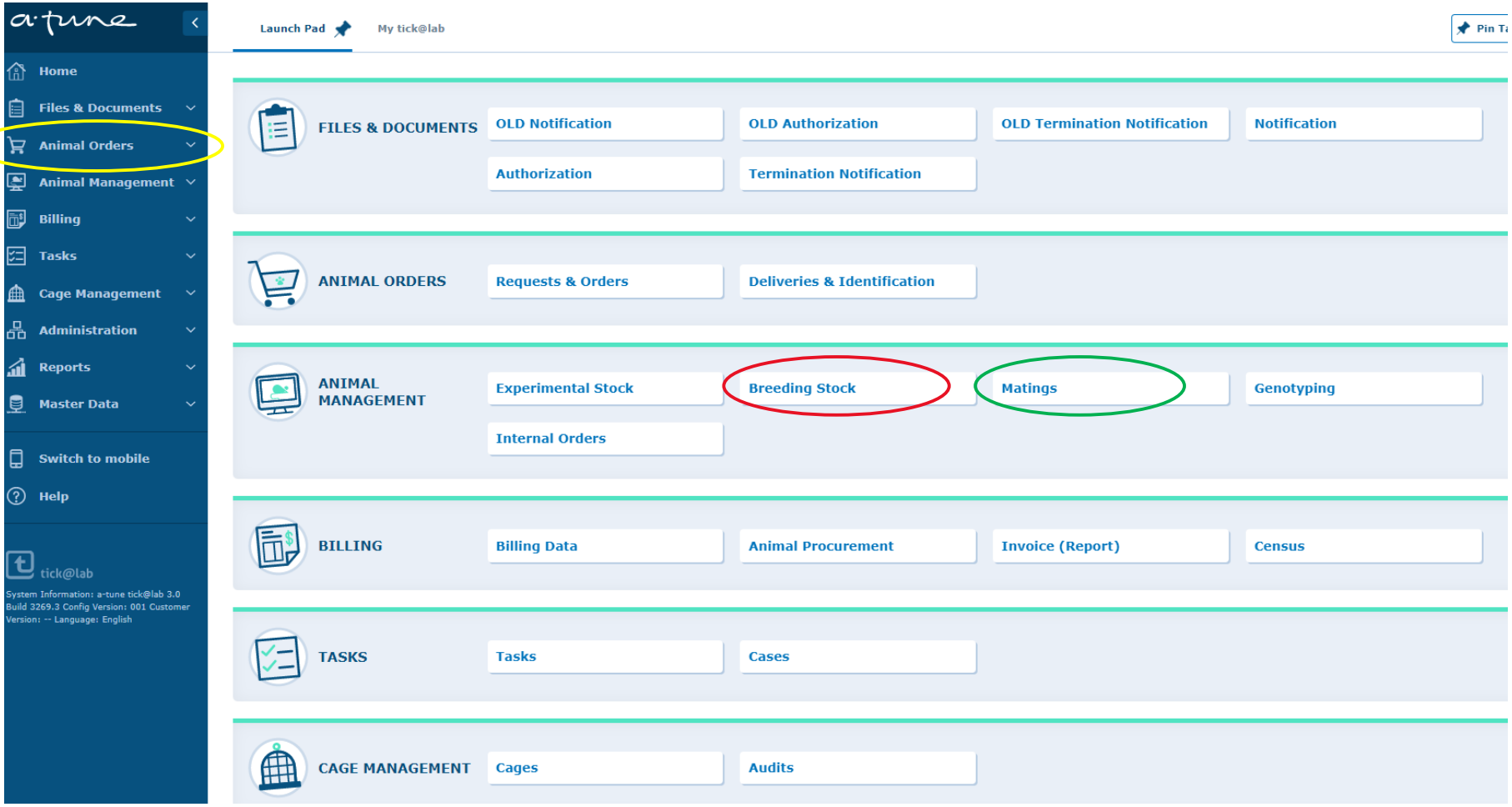
Why using a software for recording mice?

- Accurate documentation
- complete records for the whole lifespan of the mouse
- flexible data analyses (e.g. import export of files and reports)

A tune – tick@lab as database

- can be used for multiple species on campus
- shows a CV for each mouse with exact days, time and user tracking for everything that is done
- task system for colony management
- ordering system for scientist
- reports can be easily exported

Colony Management – Mouse Database



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ADMINISTRATION

- Logon Messages
- Configuration
- Cage Cards
- Templates
- Application Logs

REPORTS

ADMIN

- User
- Location access
- Master Data: Forms Data
- Audit Trail

ANIMAL HUSBANDRY

- Stock
- Animal & Medical Records
- Reclamation Report
- Room History

ANIMAL UTILIZATION & STATISTICS

- Order & Disposition
- Animal Usage
- Experimental Use
- AUP Survey
- EU Tissue Sampling
- EU bred and killed without being used

BREEDING

- Breed Registry

FILES & DOCUMENTS

- AUP Summary

CUSTOM REPORTS

- Custom Report

MASTER DATA

- Users
- Teams
- Catalog
- Catalog (NG)
- Suppliers
- Facilities
- Species
- Cage Types
- Supplier Catalogs
- CPD
- Forms Data
- Cost Centers
- Service Types
- Project Codes
- Billing Periods
- Billing Setup

Breeding stock

	S	Auto-ID	Animal-ID1	Animal-ID2	Animal-ID3	Age	DoB	No. of animals	Background	N/F	Genotype	Sire	Dam	Room	Tags	Cage-ID	Cage Name	
	♀	394968	AK3F/23/3992	#1R/L	K 126135	24d	12/08/2023	1	GBS-GFP/Rosa-DTA (AK)	N5	GBS-GFP: hom Rosa-DTA: het	370678//AK3F/23/1431//RL//K113122	371001//AK3F/23/1496//RR//K119307	I05.OG3.011		128499		✓
		395194				10d	26/08/2023	99	ROSA-DTA (AK)	N5		373745//AK3F/23/1746//R/K120047	361296//AK3F/23/893//R/LL//K112421 (113512)	I05.OG3.011		126143	K 126143	✓

Mating

No. of entries: 48

		Mating	Start date	Lab assistant	Male	Female	Date of last litter	Litter size	Cage-IDs	Cage Names	Room	Strain
^		033686	19/04/2024	Bauer, Katharina	421940//AK3F/24/221//w/o//K 133092 GBS-GFP (AK) GBS-GFP: het	421937//AK3F/24/218//w/o//K 133091 GBS-GFP (AK) GBS-GFP: het	02/09/2024	2	140207	K 140207	I05.OG3.011	GBS-GFP (AK)

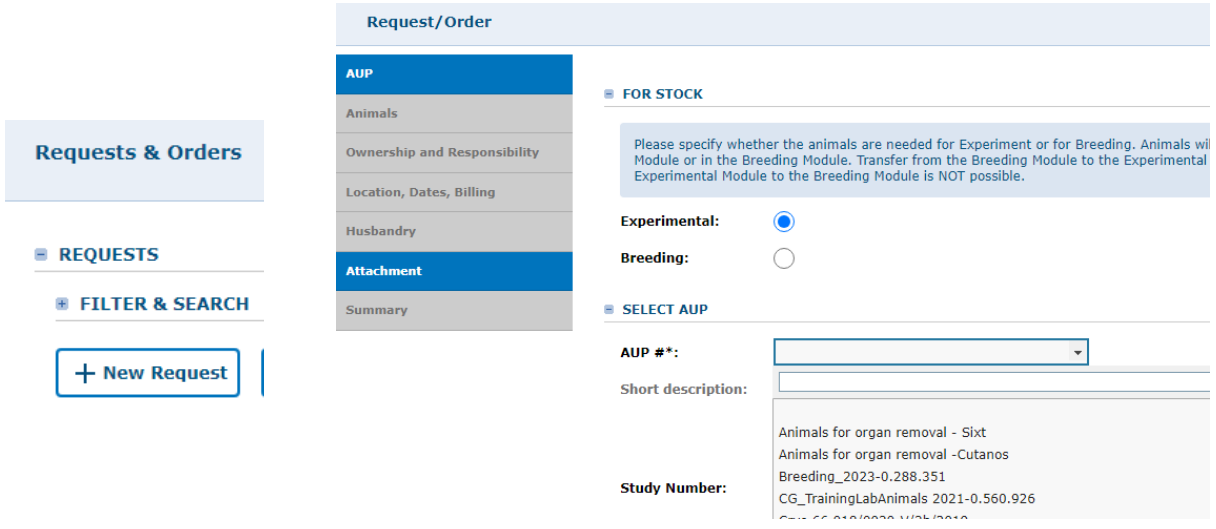
Litters

No. of entries: 6 Page 1 of 2

Litter#	Date	Dam	Sire	Born alive	Born dead	Strain
444549	11/05/2024	421937//AK...	421940//AK...	10	0	GBS-GFP (AK)
448103	31/05/2024	421937//AK...	421940//AK...	8	0	GBS-GFP (AK)
452662	22/06/2024	421937//AK...	421940//AK...	7	0	GBS-GFP (AK)
456336	12/07/2024	421937//AK...	421940//AK...	2	0	GBS-GFP (AK)
462007	13/08/2024	421937//AK...	421940//AK...	5	0	GBS-GFP (AK)

No. of entries: 6 Page 1 of 2

Animal orders



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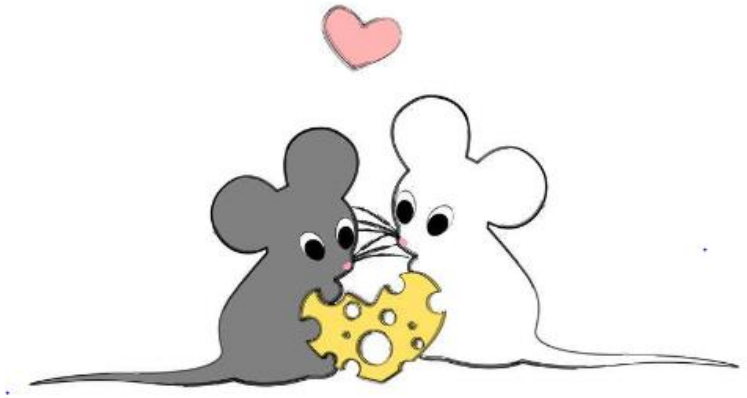
Colony Management - Breeding



- Planning and set up of breeding pairs
  - Which mouse strains are needed
    - Do we have the strains or is an import necessary (hygiene level certificate, Embryo transfer?)
  - Number of mice, age, expected phenotype and genotype

- *As many but also as few animals as necessary*
  - Reduction and limitation of colonies and costs

Breeding

Inbred: mating of brothers and sisters (20 generations) to generate genetically identical and homozygous individuals e.g. C57BL/6

+ defined genetic background, reduction of animal numbers

- spontaneous mutations can lead to a genetic drift, inbred-repression

Outbred: high genetic variability generated (inbred <1%) e.g. CD-1, Wistar

+ no inbred-repression, good breeding performance

- many breeding pairs, increase animal numbers, variability of phenotypes

Monogamy: Male and female together the whole time

Intermitted monogamy: Male is removed during pregnancy and re-added after weaning

Polygamy: Male is rotating between 2 (or more) females

Timed matings: Male is removed as soon female is plug+ (for embryo collection)

Organize different mouse strains

- 1 animal caretaker per mouse room
- Different colours for cage cards, 2 different card systems for breeding cage and maintenance cage
- Attention cards for special wishes, requests

Special sticker code:

Red dot: biopsy only 1st litter
Green dot: fluorescence check
Yellow dot: Phenotype check

Blue arrow: early genotyping

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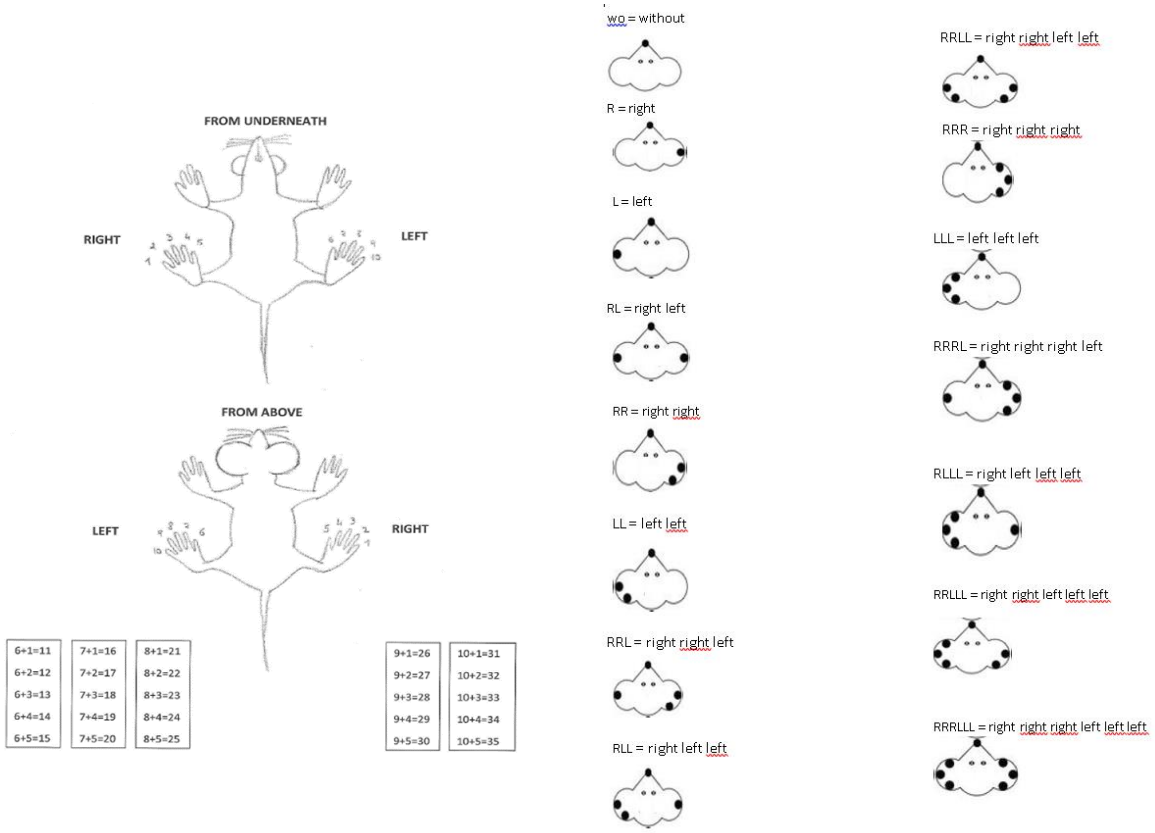
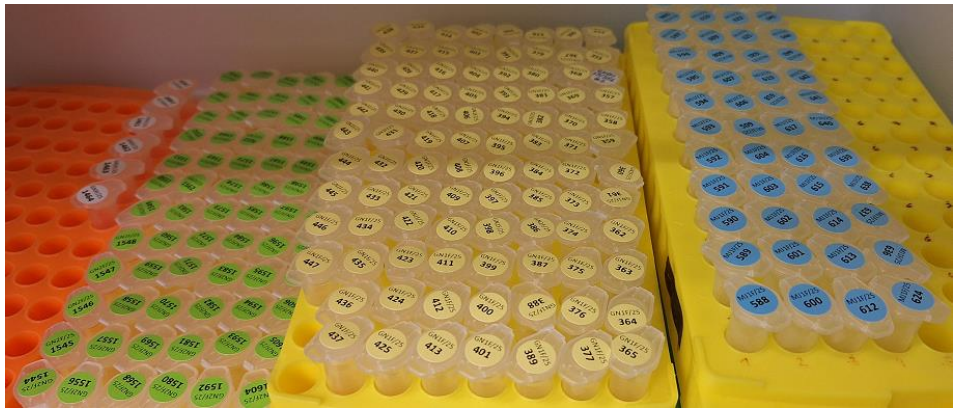
Organize tissue samples



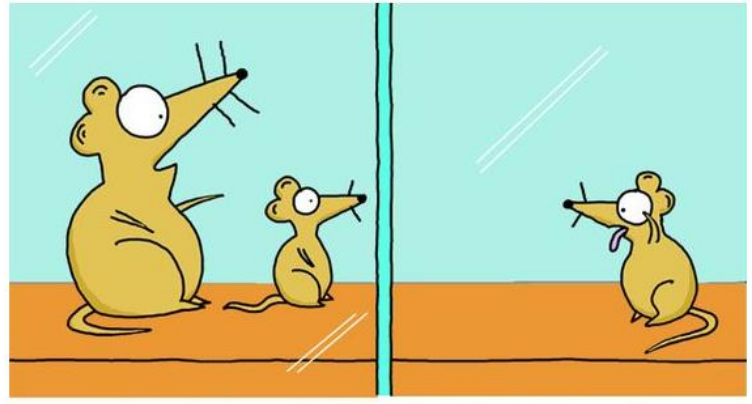


- toe clip or ear punch
- Pre-printed eppi-labels: initials of the group, year of birth, pup ID
- Different colour for different floors

Genotyping Services

- **Early genotyping P0-P5** Fast lyses with Quanta Extracta DNA Prep **(45 min)**
  https://www.quantabio.com
- **Common genotyping P6-P21** Lyses overnight, Viagen Direct PCR Tail Extraction Kit **(4h-16h)**
- DNA extraction with **Maxwell** **(30-40 min)**, high genomic DNA purification
- Sequencing with **Microsynth** VWR ExoCleanUp Fast **(30 min)** or BioLabs Monarch DNA Gel Extraction Kit **(45min)** → Sequencing overnight

- ~5300 PCR reaction per month = 1400/week
- From Biopsy to result: Fastest 2,5h


"Don't play with him, he is **Wild Type**."

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Genotyping Services

PCR Protocol R26R Confetti **Date:** 5/8/2025

Tube	Sample	
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16	K^+	
17	wt	
18	H_2O	

Mastermix	1 -fold	19 -fold	5%
ddH_2O	7.00	133.00	139.7
Phire Green Hot Start II	10.00	190.00	199.5
Primermix (10µM)	1.00	19.00	20.0
	18.00		

18µl MM + 2µl lysis

Mutant = 300 bp

Heterozygote = 300 bp and 386 bp

Wild type = 386 bp

Gel: 2%, 1x TAE Buffer, 3µl Sybr Safe
Load: 5µl ladder (100bp), 10 lysis
Run: 110 Volt, 30-35min

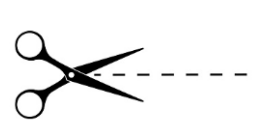
Cycling:

98°C	30sec	
98°C	5sec	30 Cycles
55°C	5sec	
72°C	15sec	
72°C	1min	
12°C	forever	

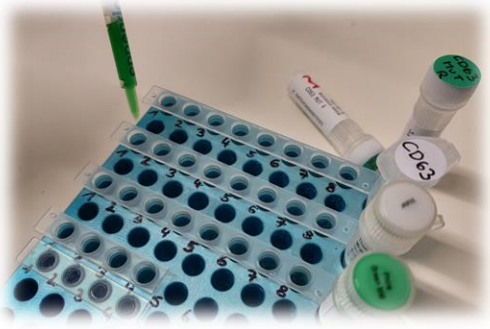
Primers:

R26R Mt *5' GAA TTA ATT CCG GTA TAA CTT CG*
R26R wt *5' AAA GTC GCT CTG AGT TGT TAT 3'*
common *5' CCA GAT GAC TAC CTA TCC TC 3'*

DNA extraction



Proteinase K



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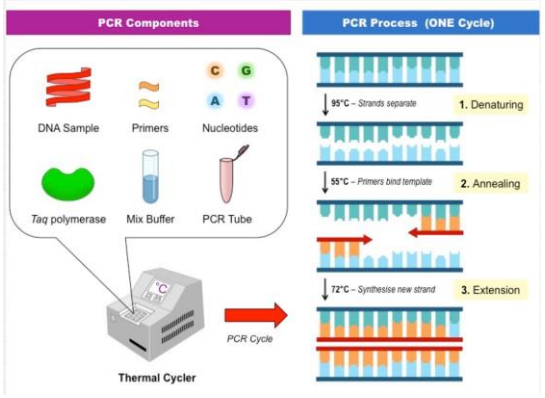
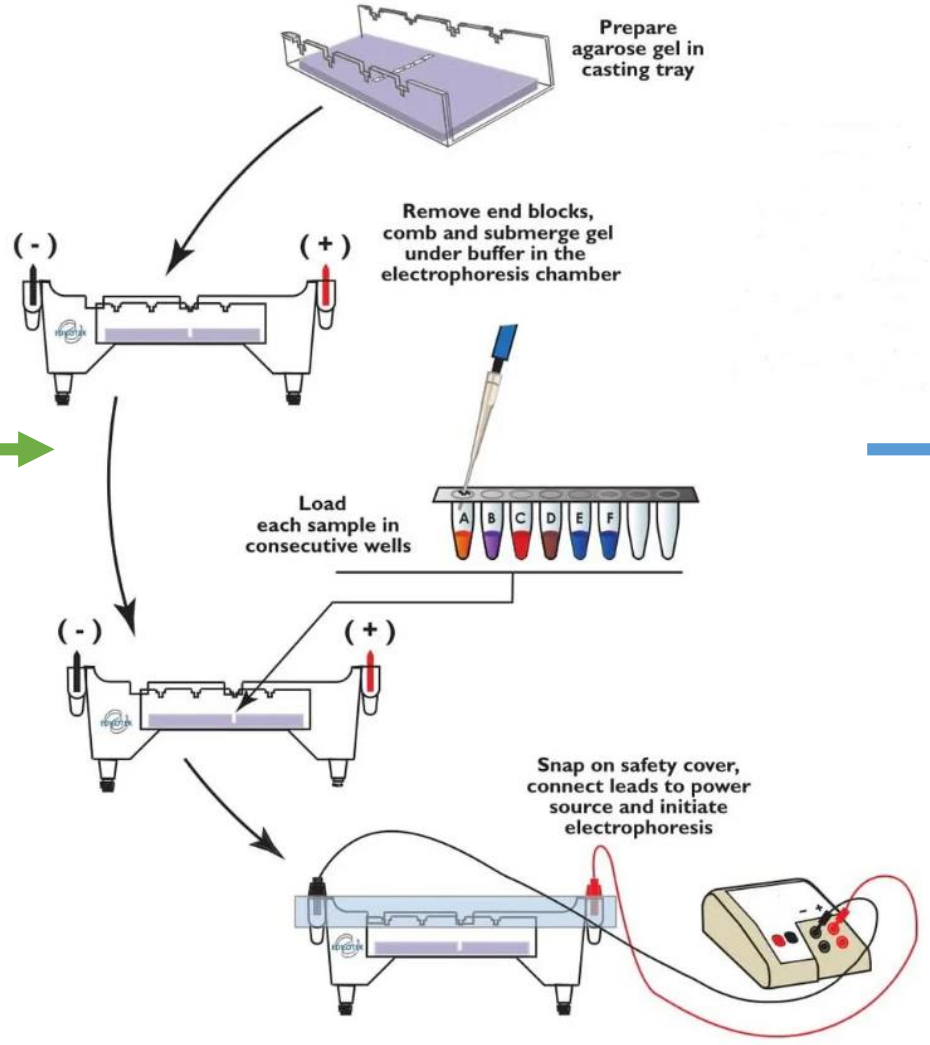
Genotyping Services – Agarose gel electrophoresis





Tube	Samples	Results
1	Embryo #1	hom
2	Embryo #2	het
3	Embryo #3	het
4	Embryo #4	wt
5	Embryo #5	hom
6	Embryo #6	hom
7	Embryo #7	wt
8	Embryo #8	het
9	WT	
10	K+	
11	H2O	

Results:

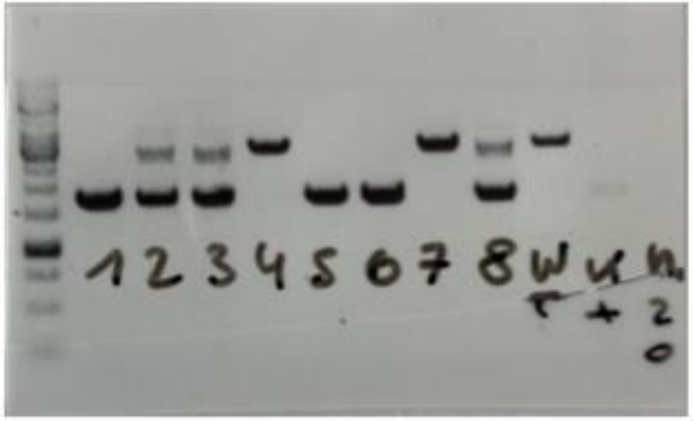
wt = 2.8 kb

het = below 2.8 kb

Gel: 1%, 110Volt 35min

4µl Sybr Safe , 9µl PCR product

Ladder: 1kb



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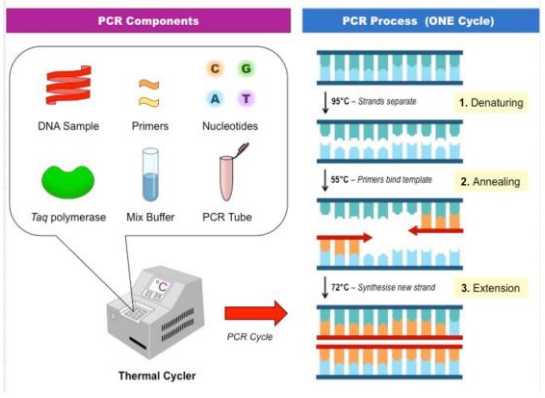
Genotyping Services – Sanger Sequencing



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Advantages for Scientists

Colony management is time consuming:

- more time to plan and do experiments, evaluate results, write papers

Fast problem solutions:

- In house pipetting give fast answers if something seems wrong
- Urgent requests will be solved (e.g. delivery of animals)
- Colony can be adjusted easily

Less stress for scientist and animal

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Thank you for your attention your PCF team!

Sabina Deixler

- Head of PCF Lab Team

Anna Heger

- Colony manager group **Hippenmeyer**
- IVF Team

Freyja Langer

- Colony manager group **Jösch**, **Sixt** and **Cutanos**
- IVF Team

Victoria Wimmer

- Colony manager group **Hippenmeyer** and **Jonas**
- IVF Team

Sonja Haslinger

- Colony manager group **Siegert**
- Support **Novarino**
- IVF Team

Katharina Bauer

- Colony manager group **Kicheva** and **Douglass**
- IVF support

Angela Stichelberger

- Colony manager group **Novarino**

Thomas Bretterbauer

- Colony manager group **Shigemoto, De Bono and Danzl**

Gregor Kollwig

- Genotyping for group Novarino

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