

# Xenopus Genome Editing Workshop Syllabus

Instructors and TAs: Robert Grainger, Takuya Nakayama, Ira Blitz, Panna Tandon, Matt Salanga, Esther Pearl, Will Ratzan and Cristy Salanga

Time	11-9 (Sun)	11-10 (Mon)	11-11 (Tue)	11-12 (Wed)	11-13 (Thu)	11-14 (Fri)	11-15 (Sat)														
BY 8:30	Arrival/check-in	Breakfast																			
8:30		Morning meeting and Lecture																			
9:00		Lecture 3: Host transfer: utility for Xenopus gene editing (Matt, Cristy); daily plan	Lecture 6: CRISPR/Cas target ID & sgRNA design, webtools (Ira, Takuya); daily plan	Lecture 8: In depth CRISPR/Cas biochemistry (Ira); daily plan	Lecture 10: How to test if CRISPR/TALEN is effective - evaluation of DSP, T7EI assays, (Matt, Pan, Takuya, Ira); daily plan	Lecture 12: Current State of Homology-Directed Repair of Targeted Double-Strand Breaks in Eukaryotic Models (Will); daily plan	Lecture 14: practical aspects of Xenopus genetics (e.g. databases, gynogenesis, etc.) (Rob)														
9:30		Tour of the NXR	Embryo sorting & injection of custom CRISPR or TALEN laevis	Demonstration of host transplantation & fertilization (Matt)	Embryo sorting & injection of custom CRISPR or TALEN laevis	cont'd for genotyping	Embryo sorting & injection of custom CRISPR or TALEN laevis	Flexible time for genotyping as needed	Flexible time for injection, phenotyping & instructors to show demonstration as needed	Lecture 15: Xenopus husbandry (Rob/Takuya/Cristy/Esther)											
10:00		Injection of tyrosinase CRISPR and/or TALEN, laevis								Host transfer survival surgery and practice, defolliculation (laevis) by Cristy						Flexible time					
10:30																					
11:00																					
11:30																					
12:00			Lunch (flexible between 11:30 - 13:00) between experiments																		
12:30																					
13:00			Injection of tyrosinase and/or six3 CRISPR and/or TALEN, laevis & tropicalis	Oocyte (laevis) injections, Tyr TALEN or CRISPR, and culture (Cristy)	Embryo sorting & injection of custom CRISPR or TALEN laevis & tropicalis	above (cont'd)	Embryo sorting & injection of custom CRISPR and/or TALEN, tropicalis	cont'd for genotyping	Embryo sorting & injection of custom CRISPR or TALEN laevis & tropicalis	Flexible time for genotyping as needed	Flexible time for injection, phenotyping & instructors to show demonstration as needed	Evaluation of host transplantation experiment	Check-out/Departure								
13:30																					
14:00																					
14:30																					
15:00																					
15:30																					
16:00	Welcome session & Dinner (BBQ)	Lecture 4: History and approaches to Xenopus Genetics (Rob)	Lecture 7: TALEN design and construction (Pan, Matt, Esther)	Lecture 9: Evaluation of F0 phenotypes (Rob, Takuya, Ira)	Lecture 11: Genotyping and generation of F1 embryos	Lecture 13: Studies on pax6 and six3: examples of analyses with TALENs and CRISPRs (Rob)	General comment about course organization: instructors will be available throughout the course for advice and consultation about specific topics, e.g. bioinformatics, microinjection, molecular biology, oocyte manipulation, general embryo work, mutation detection, genetic methods, etc.														
16:30																					
17:00		Injection of tyrosinase and/or six3 CRISPR and/or TALEN, tropicalis	As above for tropicalis	embryo lysis, PCR, DNA purification for DSP, T7EI assays	Embryo sorting & injection of custom CRISPR and/or TALEN, tropicalis	cont'd for genotyping		As above for tropicalis	Tail clipping of st 42 tadpoles (Takuya)	Flexible time for injection, phenotyping & instructors to show demonstration as needed											
17:30																					
18:00																					
18:30		Dinner (flexible between 17:00 - 19:00) between experiments																			
19:00	Orientation: course outline and plan. Lab setup (Rob, Marko)	Embryo sorting	above (cont'd)	above (cont'd)	cont'd for genotyping	above (cont'd)	above (cont'd)	Flexible time for injection, phenotyping & instructors to show demonstration as needed													
19:30																					
20:00	Lecture 1: CRISPR/Cas9 Introduction (Ira, Takuya, Rob)	Evening meeting to review daily progress; students' talks (10' x 5 people/day)																			
20:30																					
21:00	Lecture 2: TALEN Introduction (Pan, Matt Marko)	Lecture 5: Genotyping of mutations, quick assays, DSP and T7EI (Takuya, Pan)	Flexible, extra lab time																		
21:30																					
22:00	Flexible, extra lab time	Flexible, extra lab time																			