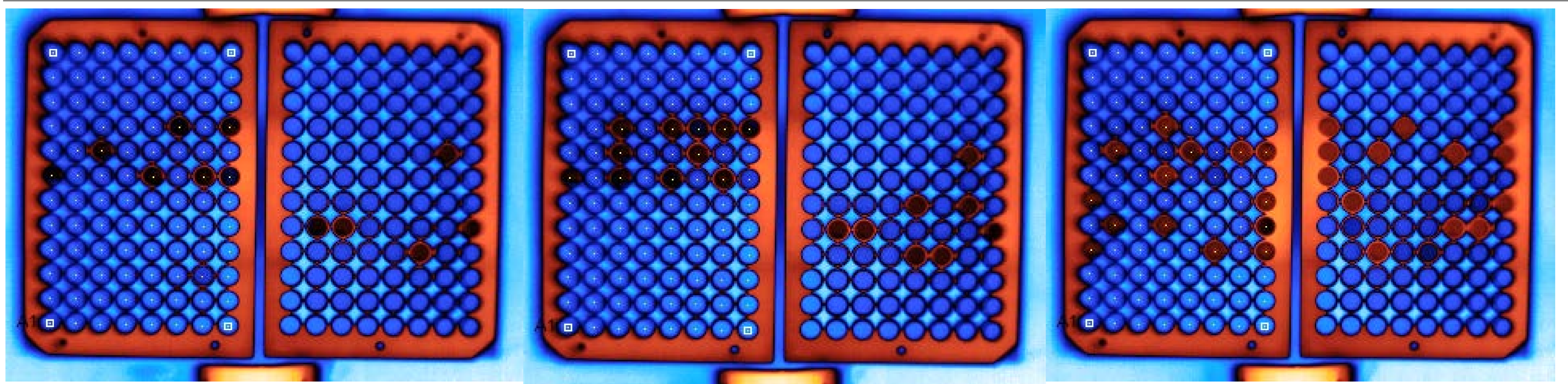
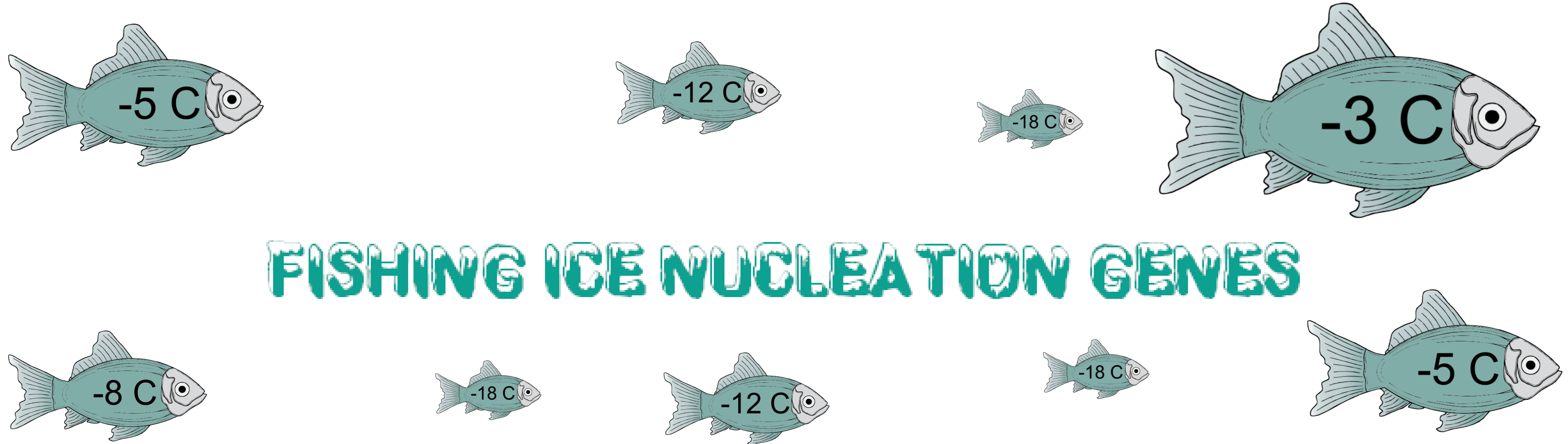
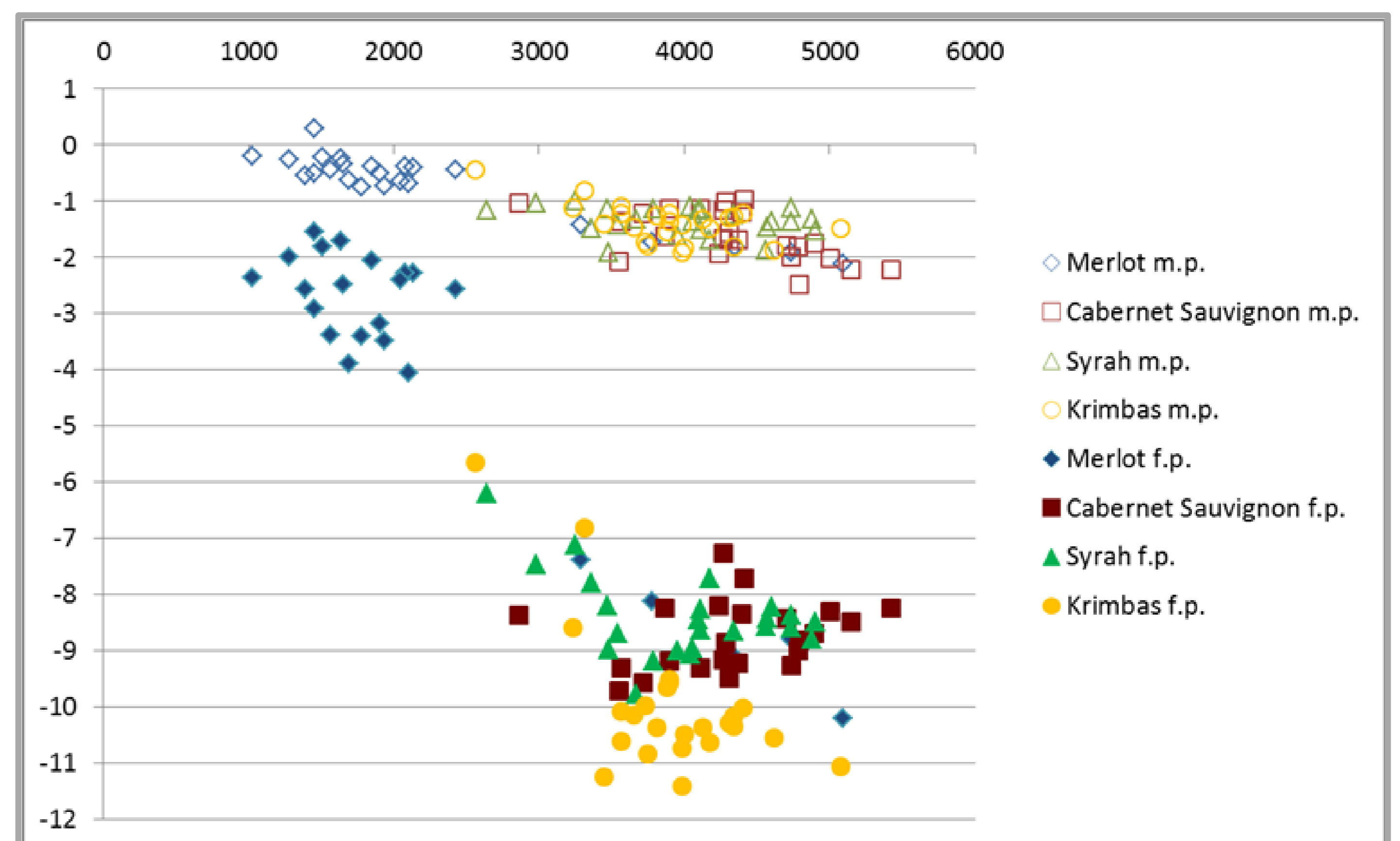
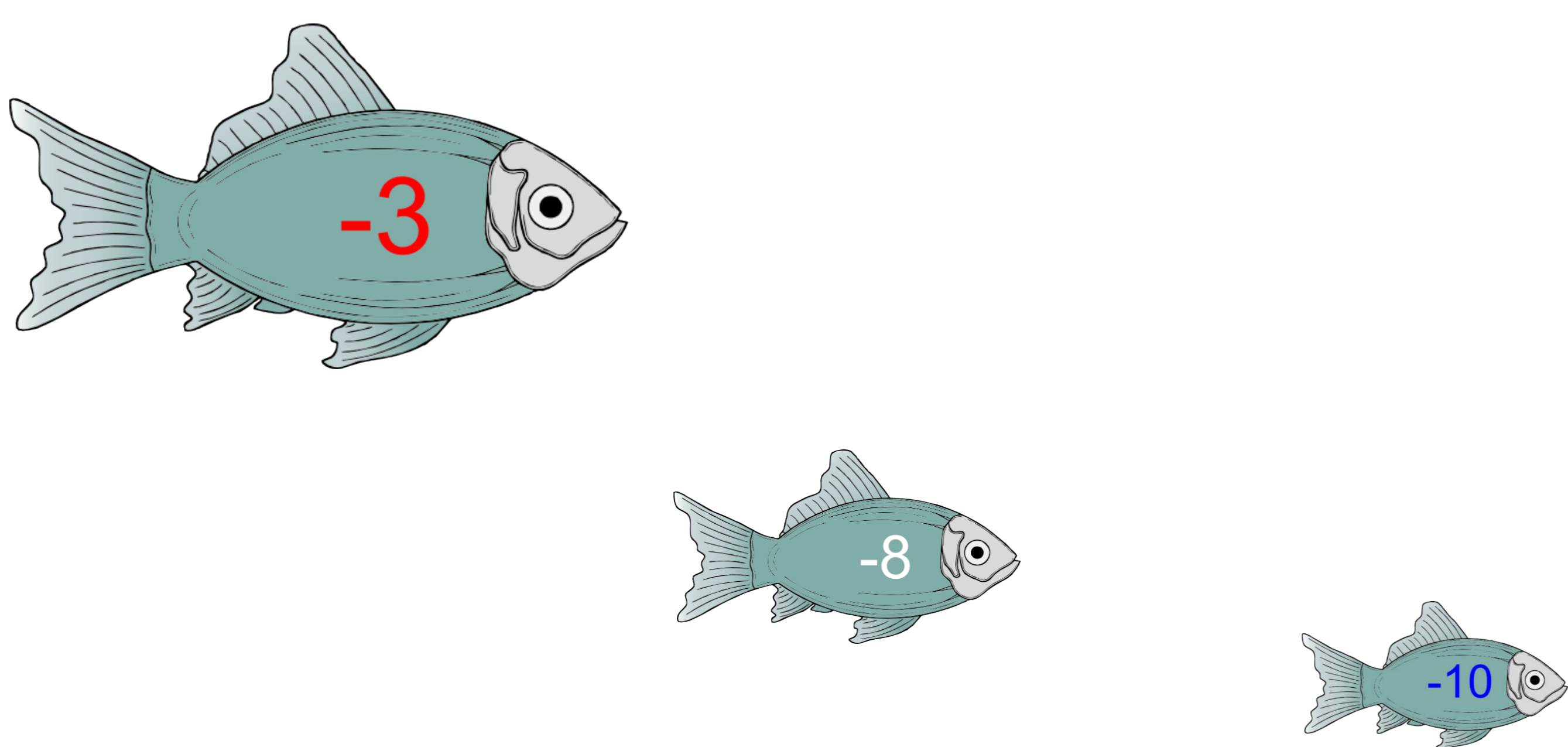


Thermal imaging integrated in a semi high-throughput screening platform for recording freezing events in plants.

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Subtracted images from a video recorded by a thermal camera mounted on top of the liquid surface of a cooling water:alcohol bath. Two 96 well microplates, filled with plant extracts are floating steady on the surface of the circulating liquid, while the temperature of the liquid drops. The freezing temperature and the melting point of the plant extracts can be accurately measured. Thousands of plant genotypes can be screened for their freezing response.



		Freezing Temperature											
		1	2	3	4	5	6	7	8	9	10	11	12
A		-1,82	-3,39	-7,40	-8,22	-9,32	-9,49	-7,72	-8,44	-7,47	-6,81	-5,65	-10,14
B		-2,06	-2,48	-8,12	-8,81	-7,71	-9,01	-8,50	-8,58	-7,12	-11,06	-10,55	-9,58
C		-2,27	-1,99	-8,79	-8,25	-9,18	-8,31	-8,58	-9,05	-8,64	-10,02	-9,51	-10,16
D		-2,28	-3,19	-10,22	-7,26	-8,87	-9,42	-8,43	-8,79	-8,70	-10,37	-9,66	-10,75
E		-2,58	-2,91	-9,13	-8,50	-9,58	-8,44	-8,23	-9,18	-9,01	-10,08	-8,59	-10,30
F		-1,71	-4,05	-3,48	-8,70	-9,17	-9,27	-8,27	-8,38	-6,21	-10,62	-10,64	-9,97
G		-2,40	-2,58	-3,41	-8,24	-9,32	-9,22	-8,20	-8,65	-7,79	-10,38	-10,85	-10,36
H		-1,54	-2,37	-3,88	-8,34	-8,37	-9,72	-8,96	-9,79	-8,98	-11,24	-10,49	-11,41

Case Study: Grape varieties leaf extract ice nucleation

Leaf extracts from four grape varieties were used in ice nucleation studies and their freezing temperatures and melting points were calculated from temperature data recorded by the thermal camera. A software program was developed to analyze the temperature data. Only the Merlot variety possessed ice nuclei, at the time of the experiment.

Freezing temperatures of microplate wells