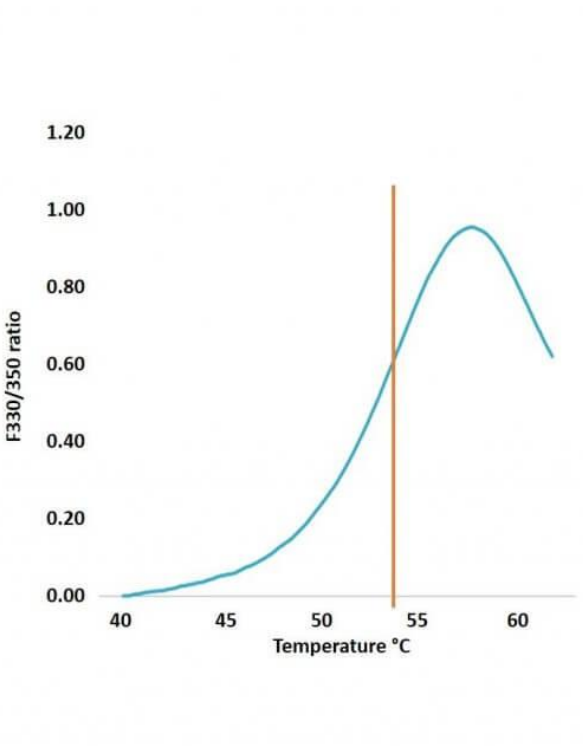
Thermal Stability of Mitogen-Activated Protein Kinase 1 (ERK2) in Different Biological Buffer Systems

ERK2 (MAPK1, mitogen-activated protein kinase 1) is an important player in multiple biochemical signalling pathways and is involved in different cancer types. In this example study, we analyzed the thermal stability of ERK2 under 30 different buffer conditions. T_m was calculated in different buffer substances with different salt concentrations in a broad pH range (4.7 to 8.0). Results of these assays present ERK2 reaction buffer (12.5 mM b-glycerophosphate, 7.5 mM $MgCl_2$, 0.5 mM NaF, 0.5 mM vanadate) to be the most adequate buffer for a high ERK2 stability with a T_m of 54.9°C. After boiling the protein for 5 min in citric acid pH 3.5, the protein is completely unfolded, no T_m was identified. This is an example for a negative control.



buffer substance	pH	Tm [°C]
ERK2 reaction buffer*	**7,2**	**54.9**
100 mM Malic acid	5.9	54.9
50 mM HEPES + 150 mM NaCl	7.2	54.9
50 mM Tris + 150 mM NaCl	8.0	54.9
100 mM MOPS	7.4	54.8
50 mM Tris + 150 mM NaCl	7.6	54.8
100 mM HBS-EP	7.4	54.7
100 mM MOPS	7.7	54.7
100 mM MOPS	7.1	54.7
1 x PBS	7.5	54.6
1 x PBS	8.0	54.5
1 x PBS	6.5	54.5
50 mM Tris +150 mM NaCl	6.8	54.4
1 x PBS	7.0	54.4
100 mM Succinic acid	6.0	54.0
1 x PBS	8.5	53.9
100 nM Tricin	7.5	53.9
100 mM Tricin	8.5	53.8
1 x PBS	7.5	53.5
100 mM MOPS	6.5	53.1
100 mM DL-Malic acid	5.3	52.8
50 mM Tris +150 mM NaCl	8.8	52.6
100 mM MES monohydrate	5.9	50.8
100 mM MES monohydrate	6.5	49.0
100 mM Glycine	9.5	47.5
100 mM Succinic acid	5.1	44.3
100 mM DL-Malic acid	4.7	39.0
100 mM Citric acid boiled	3.5	denaturated