S2 TEXT: Q10 VALUES

Modeling hypothermia induced effects for the heterogeneous ventricular tissue from cellular level to the impact on the ECG

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Content

Q10 values extracted from literature

This supplemental includes estimated Q_{10} values based on literature where the Q10 values (APD, V_{max}, CL, CV) are calculated based on two values for different temperatures, respectively, using

$$Q_{10} = \left(\frac{X_{high}}{X_{low}} \right)^{\left(\frac{10}{T_{high} - T_{low}} \right)} \quad (5)$$

where X_{high} denotes the value of the investigated feature at higher temperature T_{high} and X_{low} the value at the lower temperature T_{low}. Thereby, the two values at high and low temperature are extracted from textual description or estimated based on available graphics in the respective literature. Table I summarizes the results for APD, Table II for V_{max}, Table III for CL and Table IV for CV.

APD

Table I: Estimated Q_{10} values for APD based on literature

Q_{10}	Measure	Species	Tissue	Temperature range	Reference
0.66	APD90	guinea-pig	ventricular papillary muscle	37-27	[1]
0.83	APD95	rabbit	left ventricle	33-23	[2]
0.53	APD90	rabbit	isolated papillary muscles	37-27	[3]
0.44	APD90	guinea-pig	ventricular papillary muscle	37-27	[4]
0.48	APD90	guinea-pig	ventricular and atrial cells	35-25	[5]
0.75	APD90	pig	ventricular septum	37-32	[6]
0.61	APD70	rabbit	ventricle	37-17	[7]
0.58	APD	dog	left ventricle	36-32	[8]
0.55	APD90	rats	papillary muscles	37-10	[9]

V_{max}

Table II: Estimated Q_{10} values for V_{max} based on literature

Q_{10}	Species	Tissue	Temperature range	Reference
1.56	guinea-pig	ventricular papillary muscle	37-27	[1]
1.51	chicken	right ventricle	37-20	[10]
1.59	rabbit	left ventricle	33-23	[2]
1.65	rabbit	isolated papillary muscles	37-27	[3]
1.4	guinea-pig	ventricular papillary muscle	37-27	[4]
2.35	guinea-pig	ventricular cells	35-25	[5]

The obtained Q_{10} value for V_{max} of 1.68 used in the model was estimated by calculating the mean value of all listed Q10 values in table II.

CL

In literature, the information about heart rate is usually indicated by beats per minute (ppm). To convert values from ppm to CL following formula was used

$$CL = \frac{60}{ppm}$$

where CL denotes the value for the cycle length in seconds and ppm the value for the heart rate in beats per minute.

Table III: Estimated Q_{10} values for CL based on literature

Q_{10ppm}	Q_{10CL}	Species	Temperature range	Reference
3	0.35	rat	34-23	[11]
2	0.5	pig	37-31	[12]
3.6	0.28	dog	40-20.5	[13]

CV

Table IV: Estimated Q_{10} values for CV based on literature

Q_{10}	Species	Tissue	Temperature range	Reference
1.5	chicken	right ventricle	37-20	[10]
1.39	rabbit	ventricle	37-27	[7]
1.47	rabbit	ventricle	37-27	[14]
1.59	dog	left ventricle	36-26	[15]

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