**Lab – Semester 2**

Two lines of inquiry, S-O and geometrical obstacle

**Same Geometry**

* Moved PV – didn’t change stimulus

**Getting self-oscillations**

* Stim from base and PV – same code just change co-ordinates.
* Created a cube and ran different PV codes in the smaller geometry to see if we could get self oscialltions.
* Started running code for 6 hrs instead of 3 to try and see s-o. S-o would occur after the simulation had run with 3 hrs.
* Ran single cell code to check it was self oscillating.
* Re – indexed the single cell code that self oscillated , extending it to a 3D array so it would work in our geometry.
* Removed resting stimulus to see if we could establish spiral waves without it. To do this we set a stimulus from the base and from the top of the PV and adjusted the timings to get them to interact and create a spiral waves. Was difficult to get timings right, and had to look at the previous simulation to see how it needed to be adjusted – time-consuming.
* Set stimulus from base and got s-o.
* Timed base simulations with s-o to get spiral waves. Again fiddley, a lot of work with timings. Especially as adding the second stimuli readjusted the s-o. – saw spiral waves but didn’t pin to PV.
* Spiral waves with stopping bits in code – perfect spirals not pinned to PV.

**Heart beat**

* 9 hrs
* Start with just 2 – wiped out if too close. Tried (0.04 – 1). Got close with 0.06.
* Then ran with a repeating pulse every 400 ms for 9 hours, simulating a real heart beat. Difficult to work out repeating.

**New Geometry – same process, stimuli change.**

* More acurrate/smaller stimuli
* Pulse from SA node
* Repeated pulse from SA node, supressed any eptopic activeity. (tried different times to correspond with heart beat again). (supports aim, to see if PV provides eptopic heart beat when SA node doesn’t fire correctly and it is this that leads to AF)
* Timing to coincide with S-O, several coincides but chose beat.

Follow up – timing simulations to match S-O.

**PV as an obstacle**

* Couldn’t get second wave coming in quick enough to interact – wipes out if too close.
* No results

**Computer Methods.**

* C
* Horace to compile, 3 - 6 – 9 hrs because of S-O delay, 32 CPU

**Code**

* Stimulus (from base just adjust co-ords to get PV)
* ‘stopping’ for sipiral waves
* Repeating heart beat.

**Appendix**

Code we adjusted/used, other header files we didn’t touch

* Last code – ‘final result’
* PV cell
* 3D model.c
* Atrial variables