

## Prof. Ewan St. John Smith

I was a student at what was then Worthing Sixth Form College (1997-99), having previously been a student at St. Andrew's in Worthing and prior to that having been at St. Nicholas and St. Mary's in Shoreham-by-Sea. During my time at Worthing College I studied Biology, Chemistry and Psychology, as well as captaining the College hockey team.

My love for science started at St. Andrew's where a combination of Mr Floodgate (Physics), Mr James (Biology) and Dr Suffolk (Chemistry) got me excited about finding out how things in the living world function as they do.

At A Level Mrs Gilbert provided a touch of eccentricity to our Chemistry lessons that kept them entertaining and Julia Hoare worked wonderfully in our class to push each individual to do their best (I will never forget her inflating some sheep lungs only to find out that they had been cut to check for disease and after initial inflation, mucous just splattered out!) Kate Hall taught me Psychology, at that time in one of the huts on the old site, which was never quite warm enough in winter!

After my A Levels, I knew that I wanted to go to university and I chose to study pharmacology because I have always found the human body so interesting: how does it keep ticking along, what goes wrong in different disease states and how do drugs interact with the body to cause their effects? Part of what helped me make this decision was going to lots of university open days, some organised by college. I opted to study Pharmacology at the University of Bath because they offered lots of hands on practical work and guaranteed a year in industry.

**“ I have always found the human body so interesting: how does it keep ticking along ”**

This is a decision that I have never regretted as I spent a year working for Novartis in Switzerland, wonderful work experience and weekend trips to other parts of Europe every other weekend!

Having enjoyed the practical element of my undergraduate degree, I opted to pursue a PhD and received an offer from

the University of Cambridge. My years as a PhD student were spent trying to understand how acid causes pain. This may seem like an odd thing to study, but consider if you spill lemon juice or vinegar into cut skin, what processes are involved in detecting the acid as painful? From a clinical perspective, all sorts of inflammatory diseases, such as rheumatoid arthritis, are associated with tissue acidosis, and thus understanding how acid activates sensory nerve fibres that detect pain could lead to the development of novel drugs to relieve pain in inflammatory diseases.

After my PhD I continued as a postdoctoral researcher spending 5.5 years at the Max Delbrück Centre for Molecular Medicine in Berlin, followed by a year at New York University School of Medicine in New York City. In Berlin I began working with a very bizarre animal, the naked mole-rat.

These are rodents that live eusocially (i.e. they live in social groups with a single breeding female), are cold-blooded, live for over 30 years and are highly resistant to cancer. What for me, was, most interesting was that unlike most animals naked mole-rats fail to respond to acid as a painful stimulus.



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My research demonstrated that naked mole-rat nerves can detect acid just like human nerves, but genetic variation in a particular protein means that acid anaesthetises, rather than activates, naked mole-rat sensory nerve, i.e. it works just like a local anaesthetic at the dentist and signals fail to travel along nerves.

Moving to New York University, I carried on researching how carbon dioxide and acid activate nerve fibres, but this time on a much smaller scale as I worked with the nematode work *Caenorhabditis elegans*, which is approximately 1 millimetre long, but just like humans has sensory nerve fibres that detect painful stimuli. In 2013 I moved back to England

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and set up my own research group as a Lecturer at the University of Cambridge and was also elected as a Fellow of Corpus Christi College.

**“my time at Worthing College really helped to set me on my way as a scientist”**

Leading one’s own research group is a lot of fun, although admittedly the scientific training that I had until this point provided novel challenges, managing budgets and coordinating a research group.

The great thing about research is that you are often doing what no one has done before, you have a hypothesis, design experiments to test that hypothesis and go where the data drives you! The other part of my job is lecturing undergraduate students, largely natural science students and medical/veterinary science students, although challenging at first to lecture in front of 350+ people, this is part of my job that I really enjoy!

Within Corpus Christie College, I am Director of Studies in Biology, supervise medical students and am actively involved in the admissions process, which involves giving lots of outreach talks and the interview process itself.

When I talk to 6th form students thinking of applying to Cambridge, many think that they do not stand a chance of getting in, my answer to that is if you do not apply then you certainly will not get in: if your grades are good enough and you are excited about your subject then you should simply apply!

Looking back, my time at Worthing College really helped to set me on my way as a scientist and I am always excited to see what the College is up to and glad that the latest A Level results show students continue to excel!

