

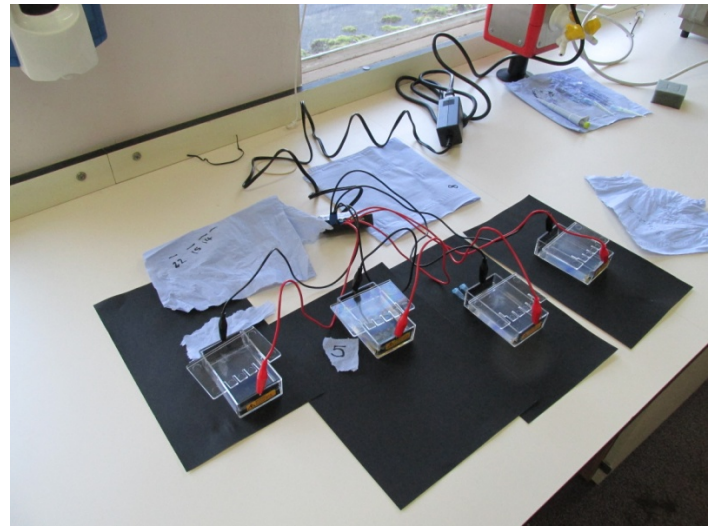
'DNA Day!' The Gordon Schools, Huntly

By Dr Avril Morrison (Biochemical Society Member)

On the 29th of September 2015, a group of 34 pupils, from S5 and S6 (age 16-18) were excused from their normal lessons to participate in a DNA day. All the pupils are currently studying towards the Scottish Curriculum for Excellence Higher or Advanced Higher.

This is the first year most schools in Scotland have offered these new qualifications, so the pupils have a lot molecular biology to learn. DNA Day gave students the opportunity to gain practical experience of experimental techniques that the school could not otherwise afford.

The event was timed to fit into the school day, from 9am to 3:45pm. We ran a total of 16 electrophoresis gels in two separate laboratories, which did create some problems with logistics! However, due to careful planning and the unstinting support of the school science technician the day before, the event ran smoothly.



Pupils were provided with a detailed booklet explaining the procedure, pens, tubes, pipettes, tips and electrophoresis tanks. The day started off with an introduction to ensure all the pupils knew *what* we were doing and more importantly *why* we were doing it.

The pupils then got stuck in practicing using the micropipettes to see how accurately they could dispense water. Using their newly discovered pipetting skills, the pupils got on with the experiment and added a cutting enzyme to a tube of DNA and left it to react for 45 minutes (timed to fit in with the school's first break). Once the pupils had refuelled and the enzyme had done its job the pupils loaded their own gels. This was a tricky step and one the pupils took very seriously. I'm pleased to report that this was a success and the gels were running by lunchtime. At this point, Dr Morrison breathed a sigh of relief.

In the afternoon, the gels were left to stain and the pupils were able to ask Dr Morrison more about her research career. They also learned more about genetic testing, including new legislation surrounding "DNA theft"; this generated much debate. The pupils also performed a simulated PCR experiment using laminated cards, and a role play discussion on the ethics of testing for breast cancer. Almost all the gels were successful and produced bands, although the interpretation had to be carried out at a later date, as the stain took longer to develop than anticipated.

DNA Day
TGS Laboratories Ltd

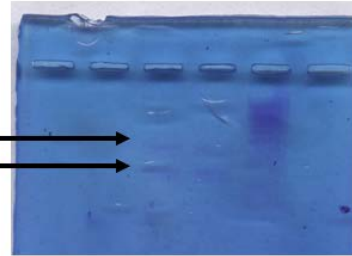
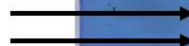


My Research

- Association for International Cancer Research
- University of the West of England
 - Kidney Cancer (Wilm's Tumour) and Leukaemia (AML and CML)



DNA



At the end of the event pupils were asked for their opinions on the day.

The discussion of the ethics of genetic testing drew many comments. Pupils enjoyed:

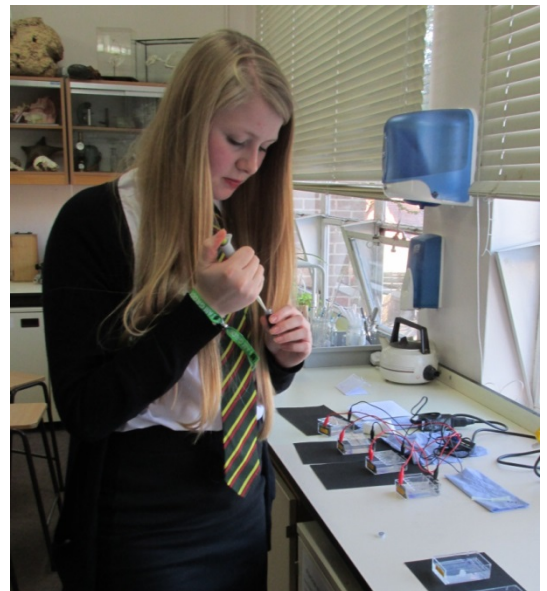
“Learning about genetic screening”

“Discovering the vast variety of viewpoints...which are held by people and the psychological effects which genetic testing may bring”

“Interpreting ideas and thoughts during the role play and debating our own opinions”

“Getting involved and understanding the details of what’s involved”

When it came to their knowledge of electrophoresis pupils had a text book understanding of the process, however, actually carrying out the experiment first hand gave them a far better understanding of the time involved in carrying out experiments.



When asked what they had learned about electrophoresis by participating in the day they said:

“I now appreciate how hard it is and how long it takes”

[I learned] “How it can be applied”

“I had heard of [DNA electrophoresis] but wasn’t really aware of what it was”

“I have acquired some very valuable first hand practical skills and better informed understanding of DNA research.”

“I now understand each step of DNA electrophoresis which before the DNA day used to slightly confuse me”

“The intense care which must be taken to achieve any results”

“The difficulties of having to do this without making a mistake”

“How long it takes to complete”

“DNA electrophoresis has to be done precisely, I learned that from experience”



The pupils had some suggestions for improvement, which we’ll take on board if we run a similar event again, these included:

“Less waiting time, so we are always doing something”

“Maybe activities to fill the relatively long periods of time between steps, like waiting for the gel to cool”

“we had to wait a long time for some of the resources like the gel and DNA exercise as there was only enough for one classroom”

“If possible a smaller overall group because due to being split between two classrooms not every group got attention and help when needed”

“I think there should have been more activities to take part in when you were waiting”

The overall comments were positive and **all the staff involved felt the pupils had gained from both the practical experience and from considering the wider implications of genetic testing.** So I will finish with a selection of these comments



“I really enjoyed the day and for it being the first DNA day at this school I think it went really well. I hope [the] DNA day happens again so other pupils can benefit from it.”

“I think the PCR laminated cards really helped me”

“I really enjoyed doing the different tasks and learning about research”

“Thank you for coming to the Gordon Schools”

Thanks are due to the staff at the Gordon Schools, especially Mrs Thomson, Mr Rowand and Mr Whyte for arranging and supporting the DNA day.