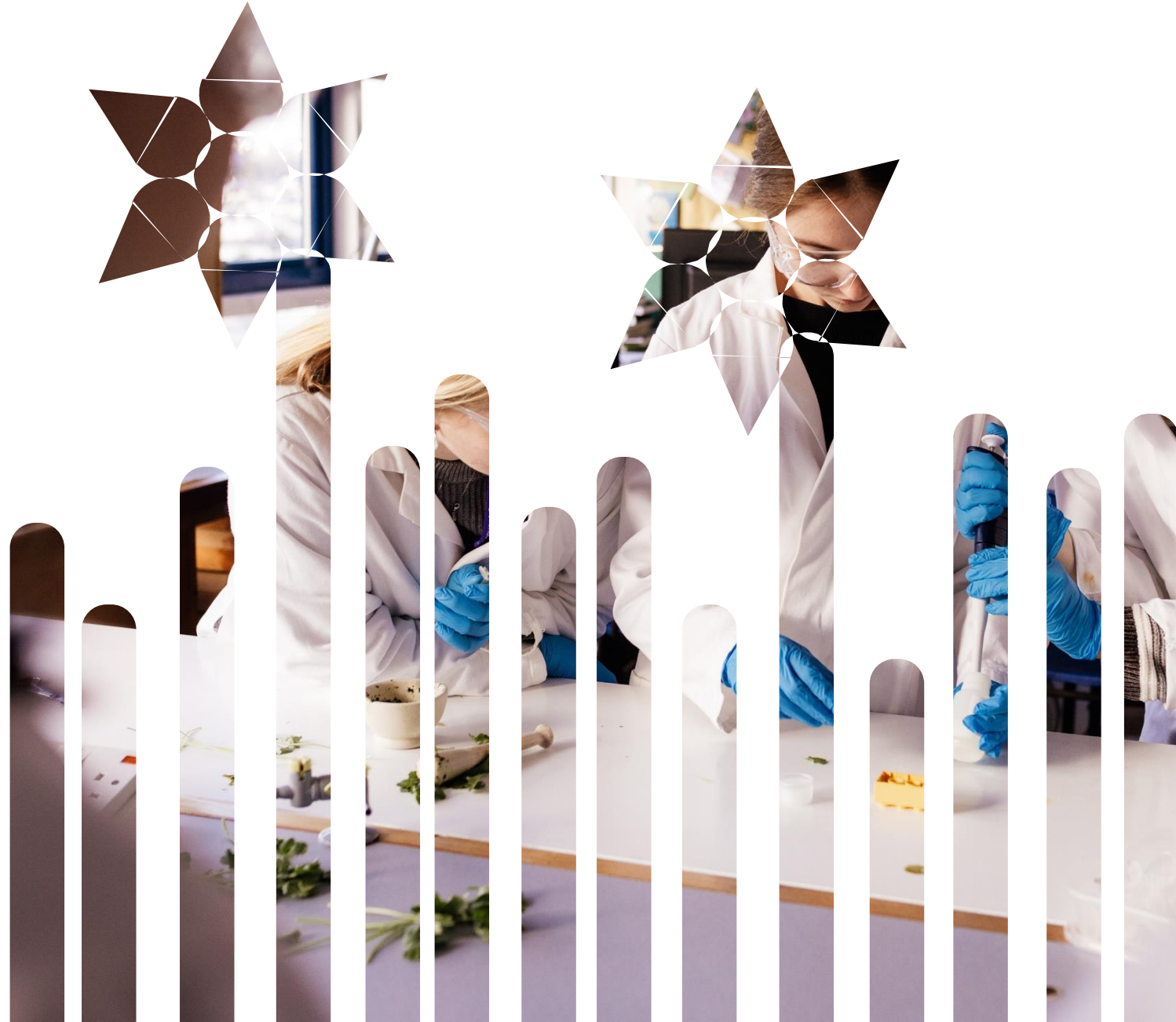


Daffodil DNA Project

24 September 2024

Jon Hale
Beaulieu Convent School
&
University of Dundee



Overview

- Background of the project
- Scaling-up
- Key attributes of stakeholders
- Challenges going forward
- Questions

Join at [slido.com](https://www.slido.com)

#3383789

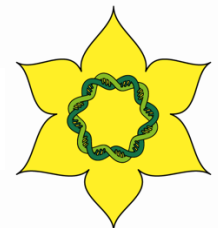
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(P) W39A
(L) R155A



Dundee Botanic Garden
University of Dundee



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DNA
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slido

What does a daffodil look like?



2018

2019

2020

2021

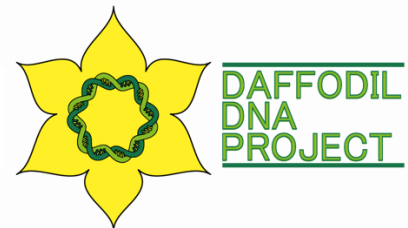
2022

2023

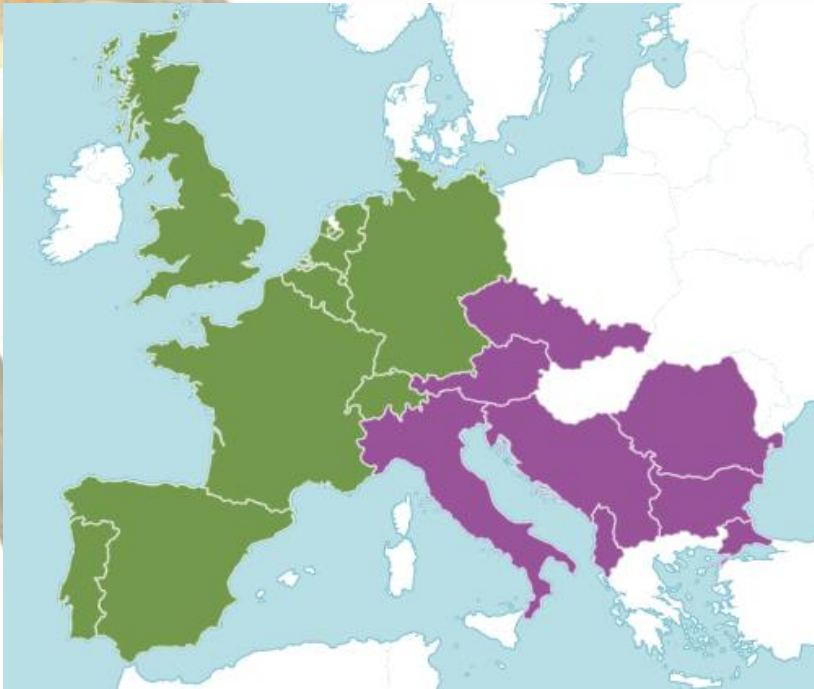
2024



BC5010 W50403202C
 LOCATION: SAULT BRÉCHA DES
 48°11'10"N 2°12'56"W
 (N) 8136C
 (P) W39A
 (L) R155A



Why daffodils?



¹ <https://powo.science.kew.org/taxon/urn:lsid:ipni.org:names:66177-1>

² <https://www.ocr.org.uk/blog/developing-a-connected-approach-to-a-level-biology-a-through-the-daffodil-dna-project/>

2018

2019

2020

2021

2022

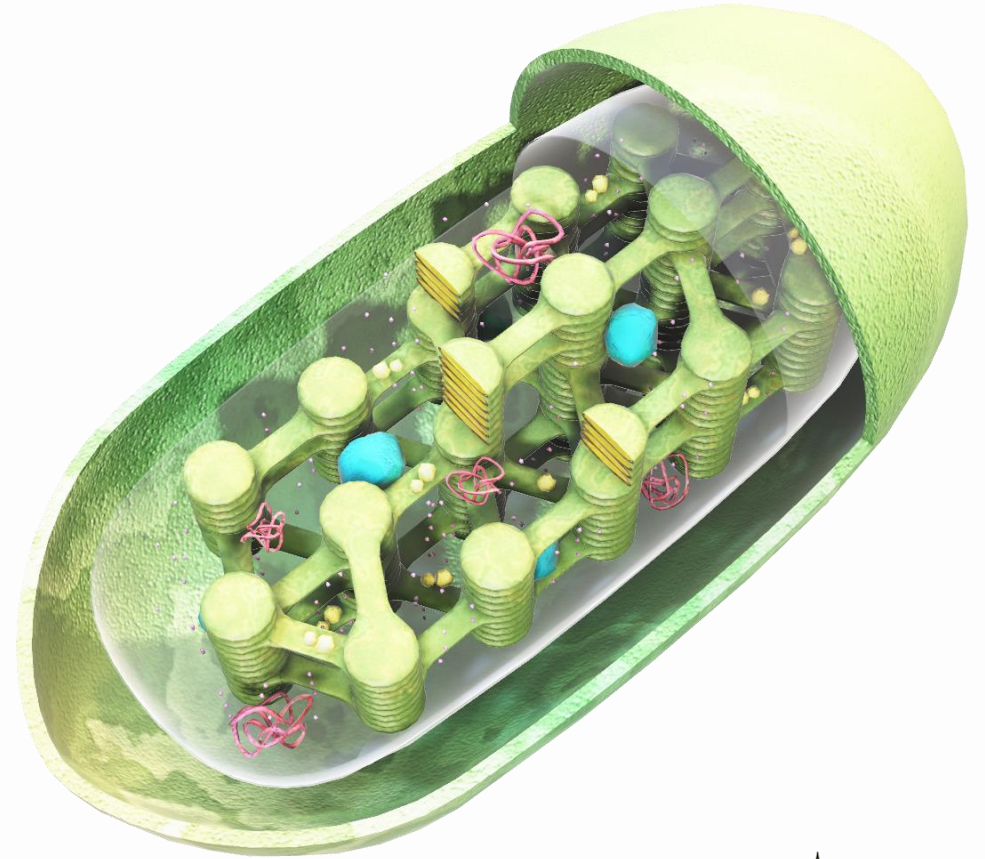
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2024

A62-P

Special sheet 3
for use with Q.4
Specimen S

OXFORD LOCAL EXAMINATIONS
General Certificate of Education
Advanced Level
Summer Examination 1978



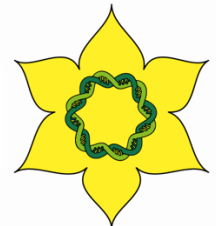
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2018

2019

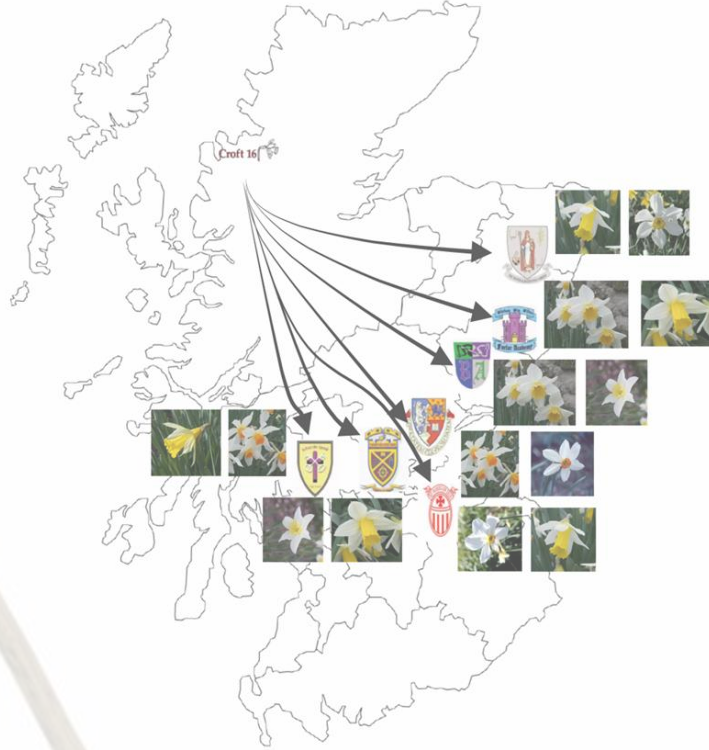
2020

2021

2022

2023

2024



ENA European Nucleotide Archive

Enter text search terms Search

Examples: histone, EN000005

PRJEB57832 View

Examples: Taxon:9606, EN000005, PRJEB402

Home Submit Search Rulespace About Support

The ENA Advanced Search API changed on 2023-05-02! Details here.

Project: PRJEB57832

Developed from a Royal Society Partnership Grant project in 2019, led by teacher Jon Hale on the Island of Jersey, this new collaborative school-based research project is brought together by The University of Dundee Education and Social Work, The University of Dundee Botanic Garden, The University of Dundee School of Life Sciences, The Royal Society, The James Hutton Institute, schools across Scotland supported by Jon Hale and using living collections from the National Trust for Scotland Brodie Castle and Croft 16. The 9 schools involved in this project worked in parallel to obtain genetic data on a very understudied, yet valuable genus. The students are working with STEM professionals and academics to grow various daffodil varieties, extracting DNA from their leaves and using Oxford Nanopore Minion DNA sequencing in the classroom before assembling the chloroplast's genome. An automated assembly and annotation process was subsequently carried out by the University of Dundee Data Analysis Group.

Show More

View: XML
XML (STUDY)

Download: XML
XML (STUDY)

Navigation: Show

Read Files: Hide

Related ENA Records: Show

Secondary Study Accession: ERP142637

Study Title: Sequencing chloroplastic DNA from heritage Daffodil cultivars in Scottish schools.

Center Name: University of Dundee Data Analysis Group

Study Name: The Daffodil DNA Project 2022

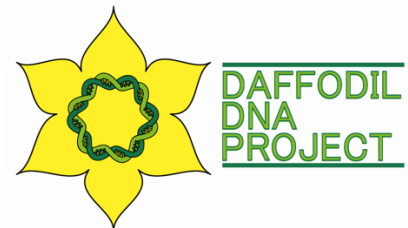
Funding Agency: The Royal Society, The Friends of the University of Dundee Botanic Gardens, Wellcome Trust: 2182592/19... [Show More](#)

ENA-FIRST-PUBLIC: 2022-12-11

ENA-LAST-UPDATE: 2022-12-11

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PERSPECTIVE



Engaging the next generation of plant geneticists through sustained research: an overview of a post-16 project

Jon Michael Hale ¹

Received: 19 January 2020 / Revised: 8 September 2020 / Accepted: 8 September 2020 / Published online: 17 September 2020
© The Genetics Society 2020



Received: 2 January 2024 | Revised: 12 May 2024 | Accepted: 17 May 2024
DOI: 10.1002/ppp3.10550

BRIEF REPORT

The Jersey Daffodil Project: Integrating nanopore sequencing into classrooms improves STEM skills, scientific identity and career development

Jon Hale ¹ | Alex Harkess ² | Kálmán Könyves ³

Plants People Planet PPF Open Access

Beaulieu Convent School Jersey
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(L) R135A



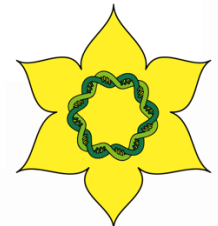
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University of Dundee



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The St Thomas @DaffDNA Team are very proud to be presenting their research alongside the UK's top scientists at #SummerScience this Wednesday and Friday! @malcolmacaulay @JoCoxSTEM @royalsociety #partnershipgrants



3:38 PM · Jul 6, 2022

Delegates were treated to a display of 56 stands in the main Exhibition, and were able to interact with exhibitors, browse a wide range of new resources and products and take away the customary 'freebies'!



Education in Science - February 2023

17

#2: Sequencing by young(er) Scientists

What's in My Sandwich by Sophie Zaajier, #DaffDNA by Jon Hale, Pet Angelfish genome by Indeever Madireddy

Cutting Edge: Using mobile sequencers in an academic classroom

Sophie Zaajier, Columbia University Ubiquitous Genomics 2015 class, Yavin Erlich
Columbia University, United States, New York Genome Center, United States, Center for Computational Biology and Bioinformatics, Columbia University, United States
Apr 7, 2016 · #nanoporeconf10.734k views · 142K



The Daffodil DNA Project



The Daffodil DNA Project
@DaffDNA
A collaborative project between schools and scientists funded by @royalsociety #partnershipgrants to decode the genetics of daffodils
#geneticsSOCIETY
Engaging the next generation of plant geneticists through sustained research: an overview of a post-16 project
Jon Michael Hale

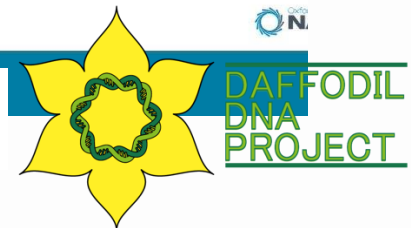
High school student i sequence the angelfi

17-year-old Indeever Madireddy sequenced the first time this species has been sequenced
Oct 21, 2022
By Michael La Page



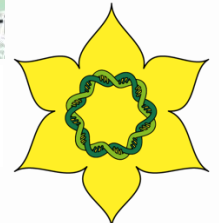
Nanopore Community Meeting 2022 | @NanoporeConf | #NanoporeConf
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2024 Cohort

- 17 new schools joining the current 10.



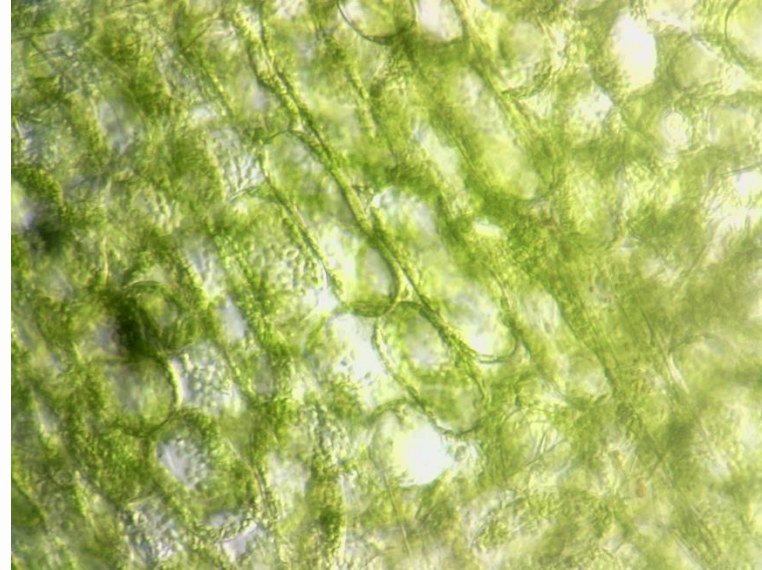
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Curriculum links

- Photosynthesis
- Genetic technologies
- Variation
- Selective breeding
- Cell ultrastructure
- Plant defences
- Reproduction
- Bioinformatics and computational biology



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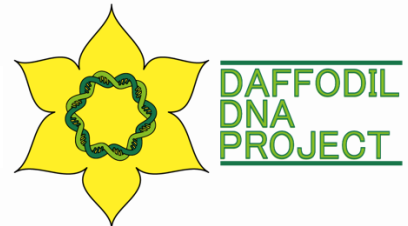
Key Attributes of Teachers

1. Identified a gap in their subject knowledge
2. Want to provide opportunities to their students
3. Wanted to do something different
4. FOMO

Teacher Training and Support



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(L) R155A



STEM Partners

- Act as supporters, there to help teachers problem solve and develop skills.
- A contact for students to ask career questions to.



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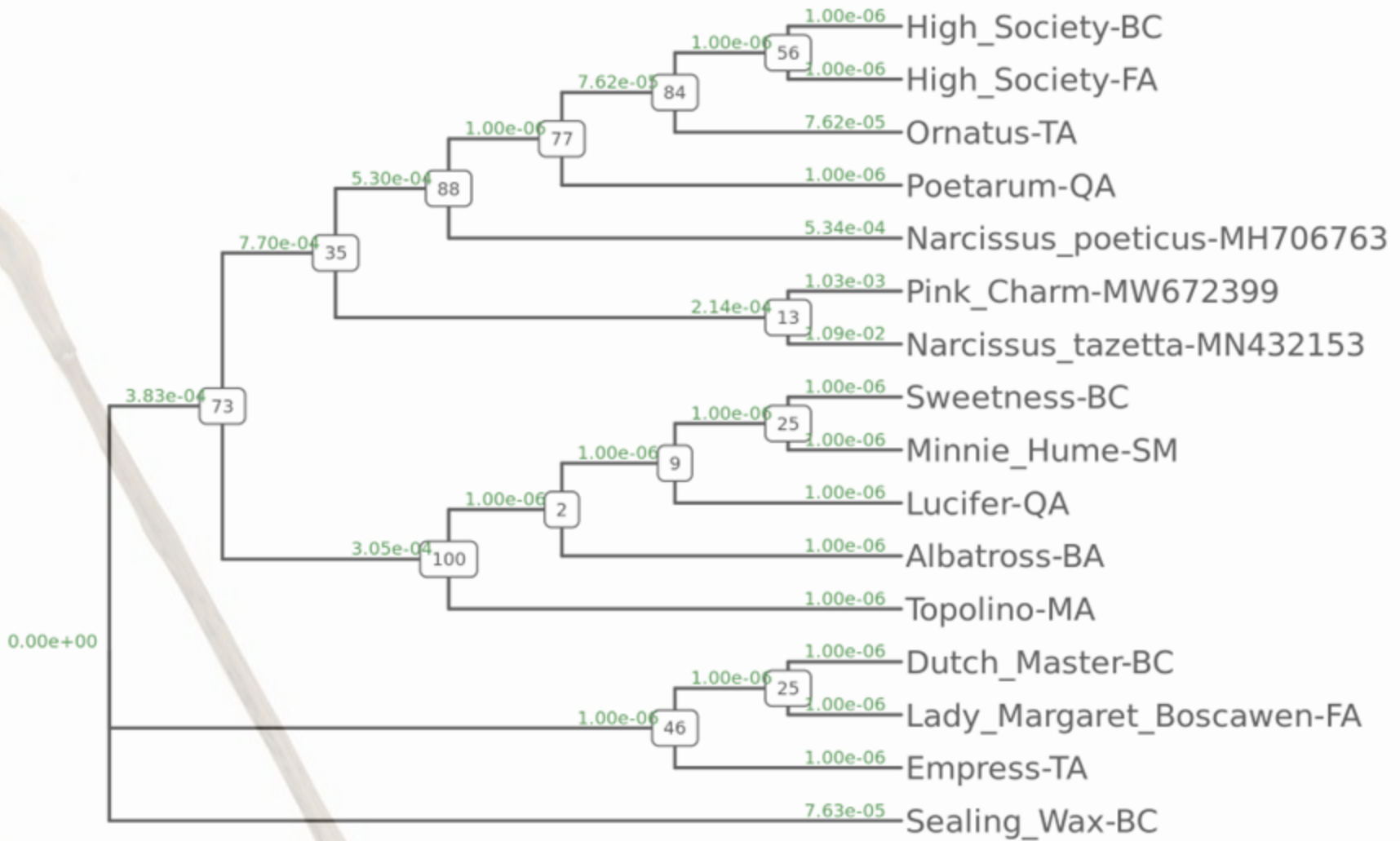
Dundee Botanic Garden
University of Dundee



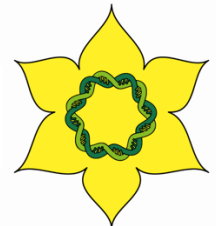
School of Life Sciences
University of Dundee



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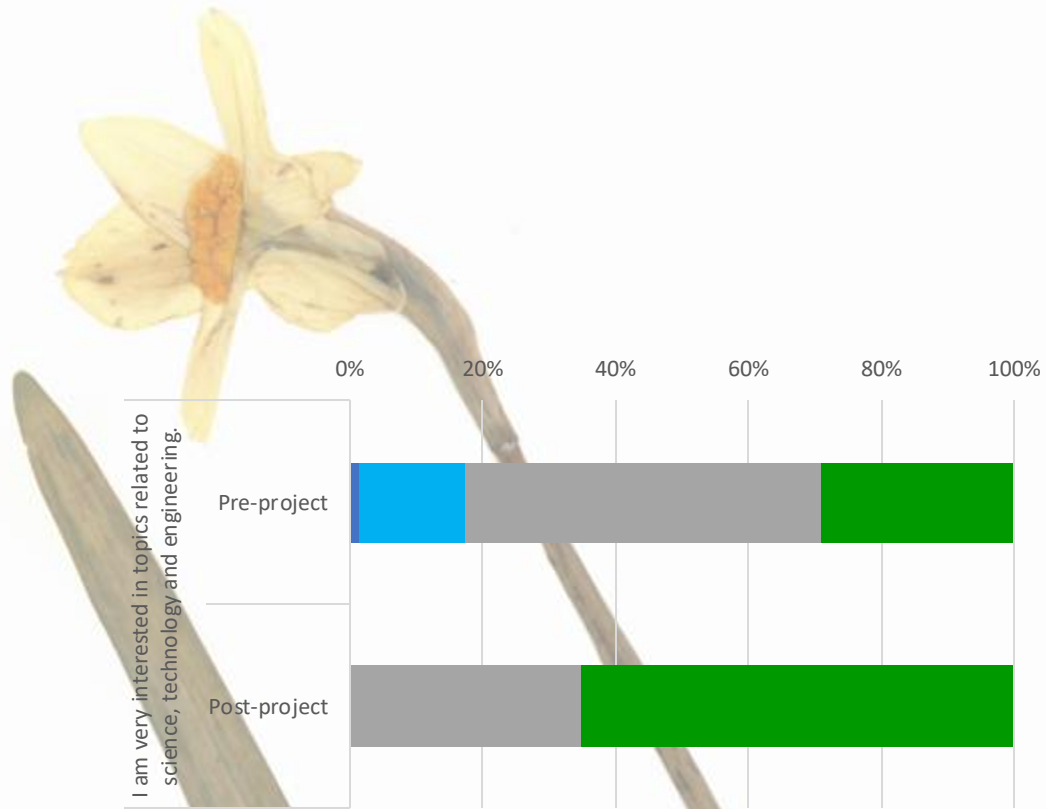
Radar plot to show changes in attitudes towards STEM prior to commencing the Daffodil DNA Project (n=69) and following the project (n=23)



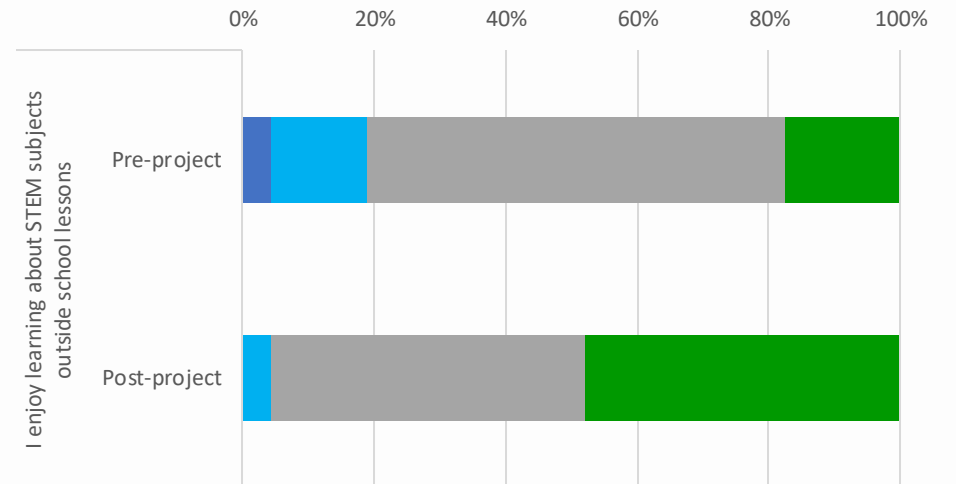
Pre-project
Post-project



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■ Strongly Disagree ■ Disagree ■ Agree ■ Strongly Agree



■ Series1 ■ Series2 ■ Series3 ■ Series4

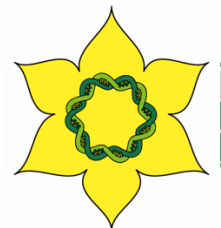
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What "soft skills" would you like to see your students develop?



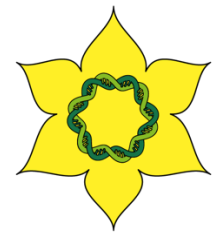
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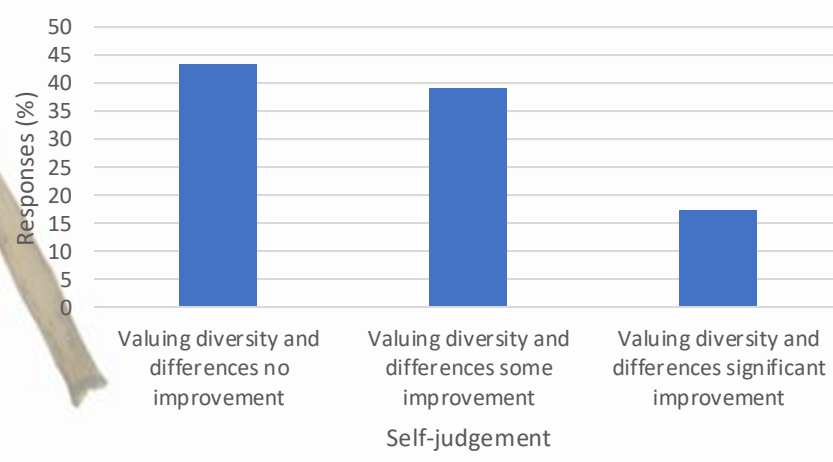
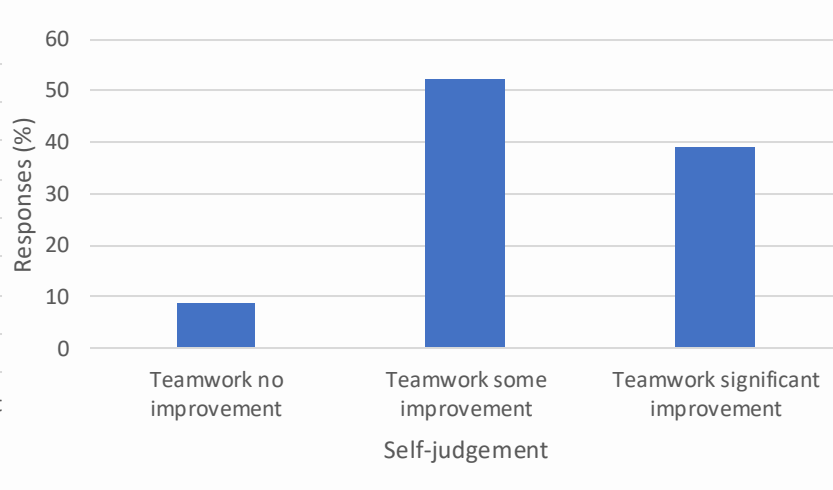
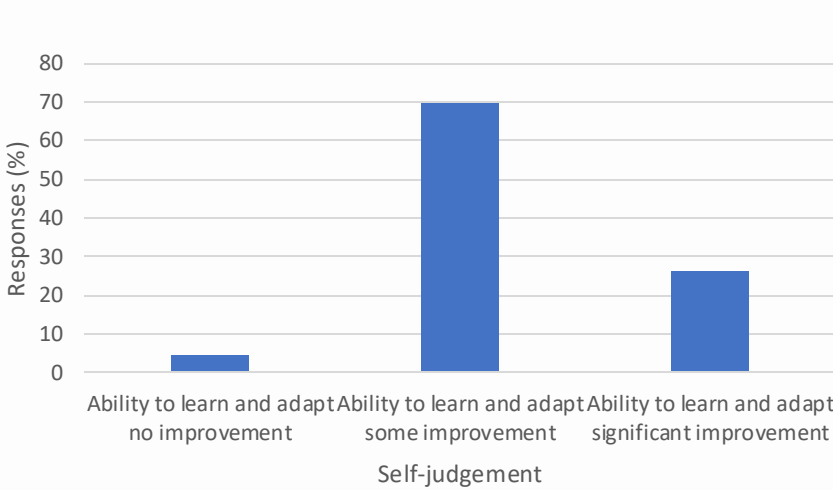
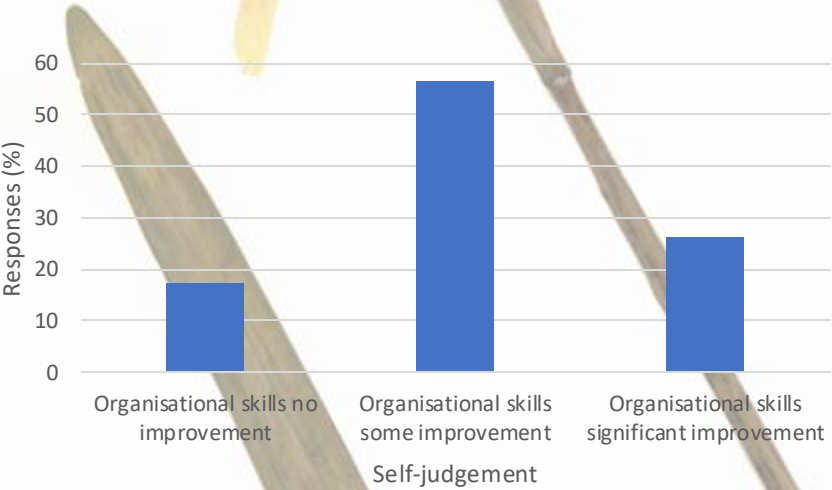
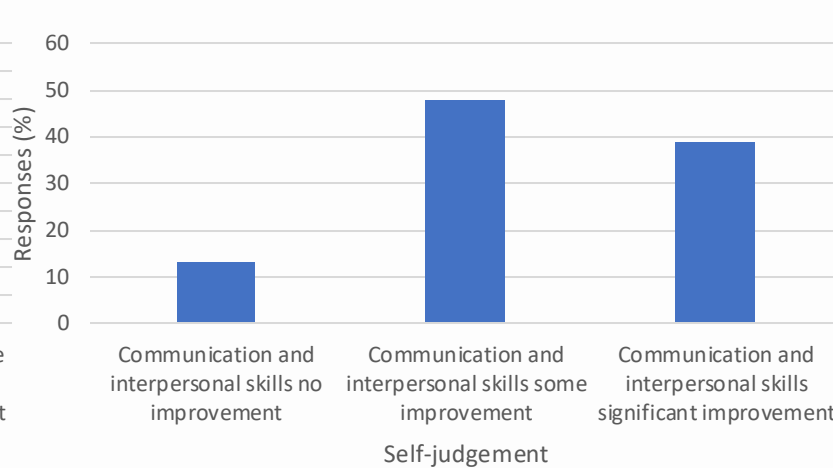
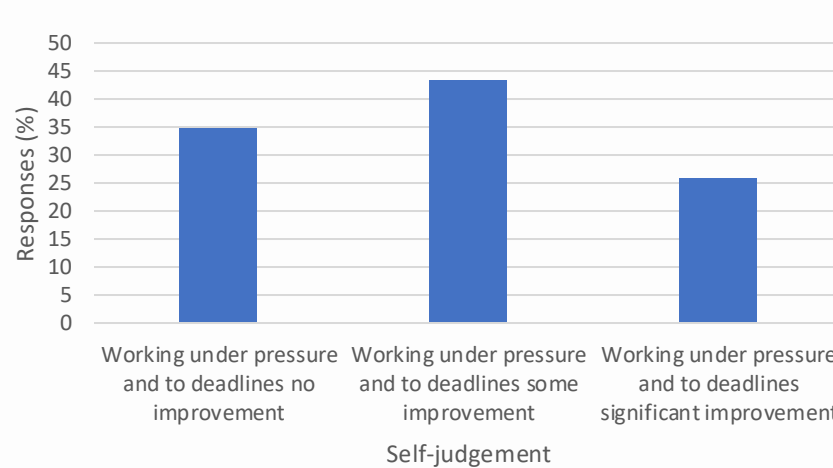
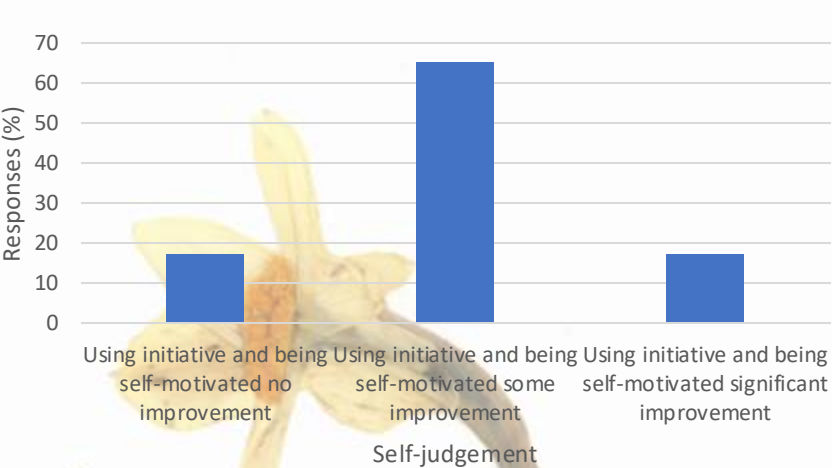
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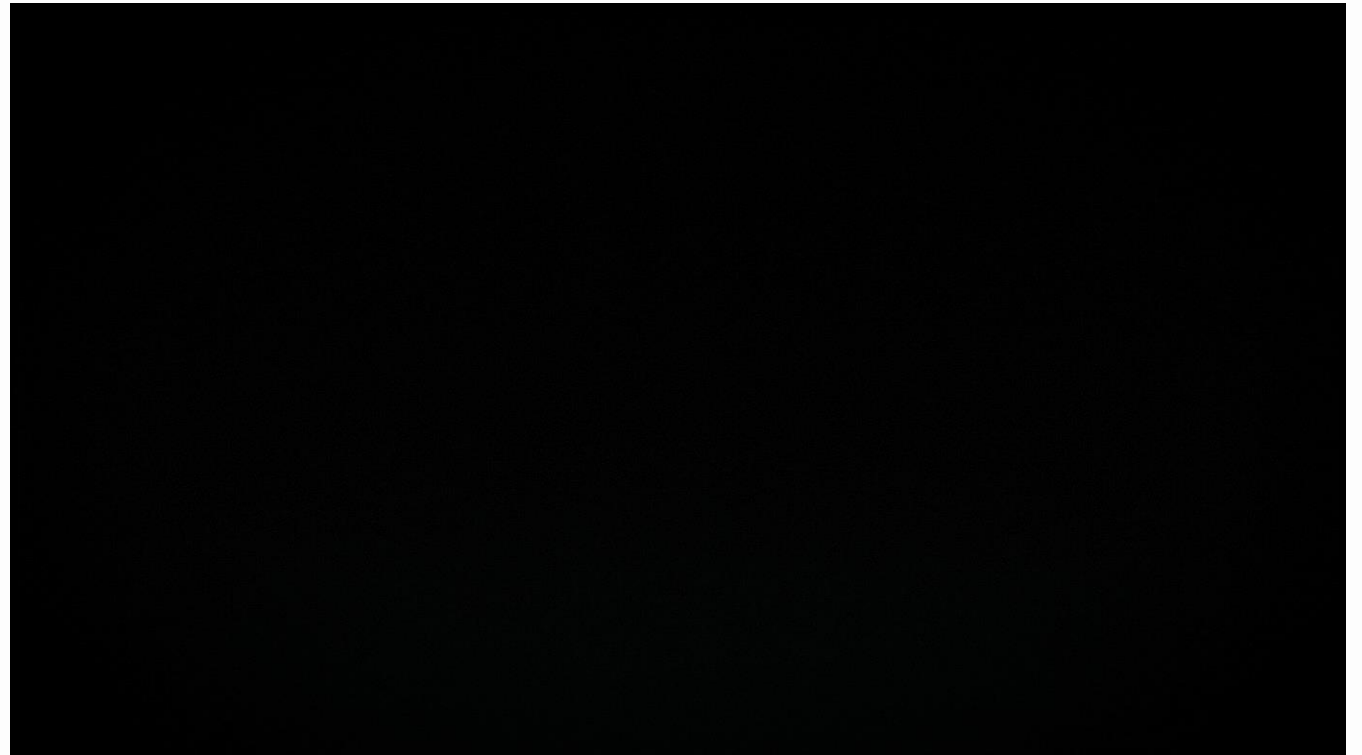
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Impact on student aspirations

“I didn't know what I wanted to do at the start of my A levels and I was leaning towards becoming a History teacher, now I want to be a Biochemist.”



Challenges

- Costs of hardware
- Recruitment of STEM partners
- Personnel changes at the University of Dundee

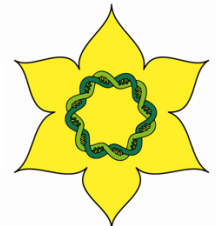
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Follow the project

Websites: <https://dag.compbio.dundee.ac.uk/daffodils/>
<https://sites.dundee.ac.uk/dundee-daffodil/>

Twitter/X: @DaffDNA

Email: 2466338@dundee.ac.uk

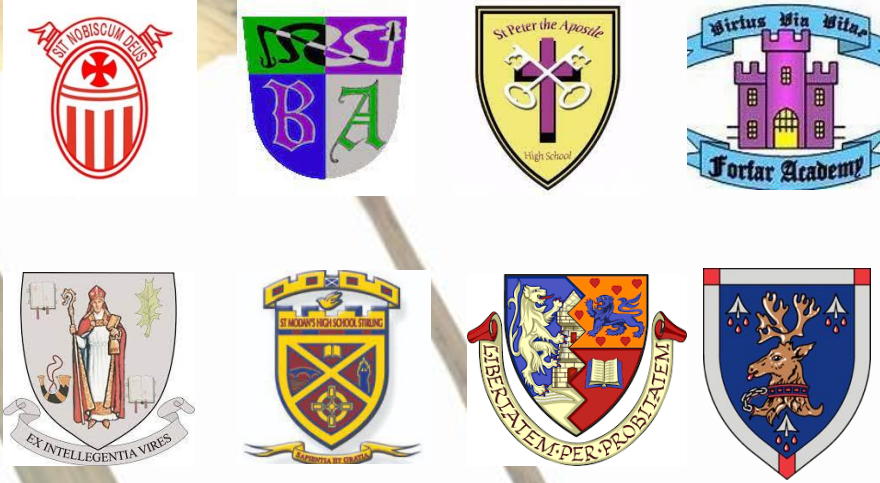
Links

- <https://www.rsb.org.uk/biologist-features/decoding-the-diversity-of-daffs>
- <https://www.minipcr.com/meet-a-scientist-jon-hale/>
- <https://www.ocr.org.uk/blog/developing-a-connected-approach-to-a-level-biology-a-through-the-daffodil-dna-project/>
- <https://www.nature.com/articles/s41437-020-00370-0>

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Special thanks to:

Schools



STEM partners

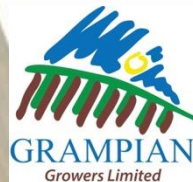


Additional support



Funding

FUNDED BY A PARTNERSHIP GRANT FROM
THE ROYAL SOCIETY

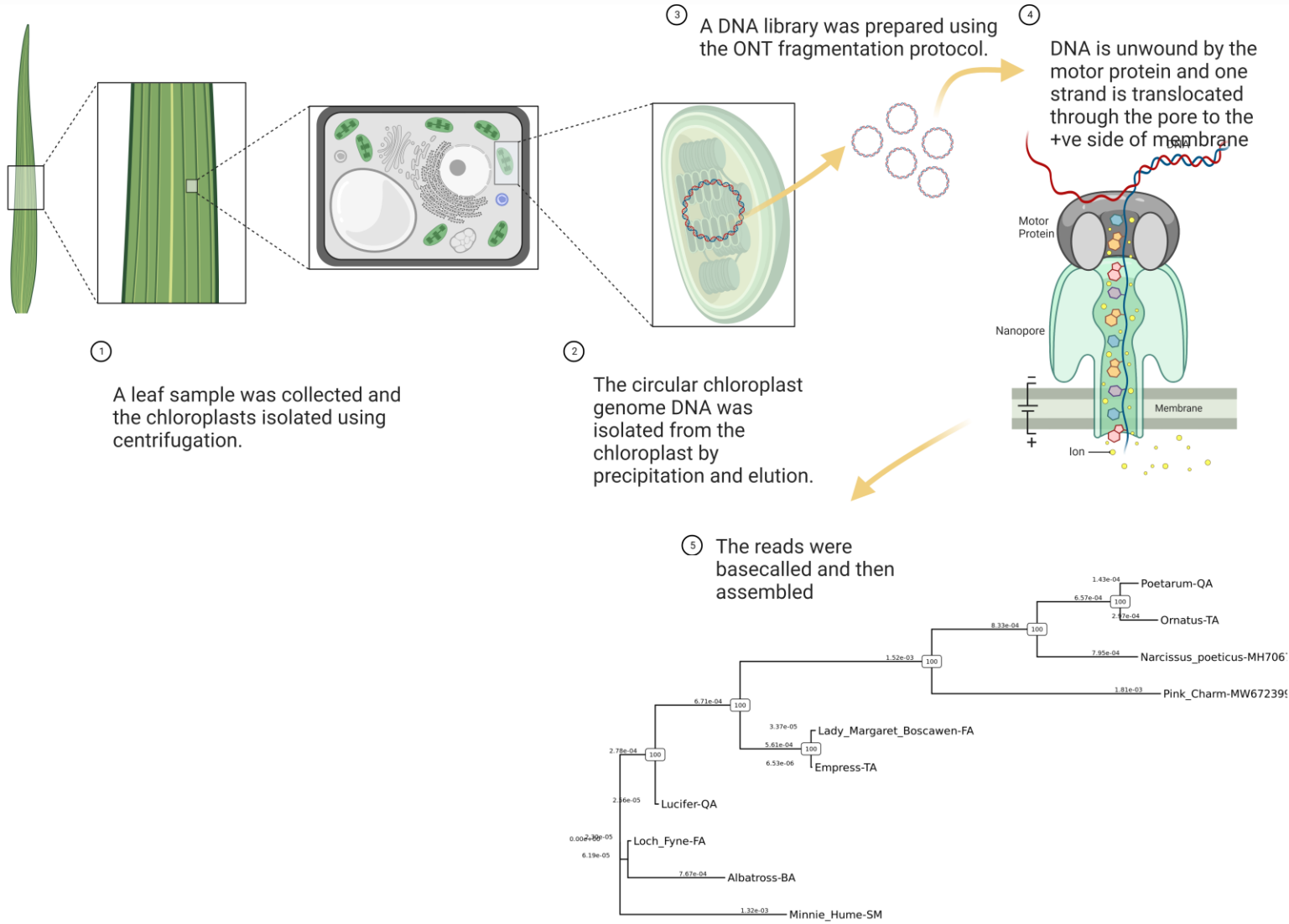


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Charities
Number
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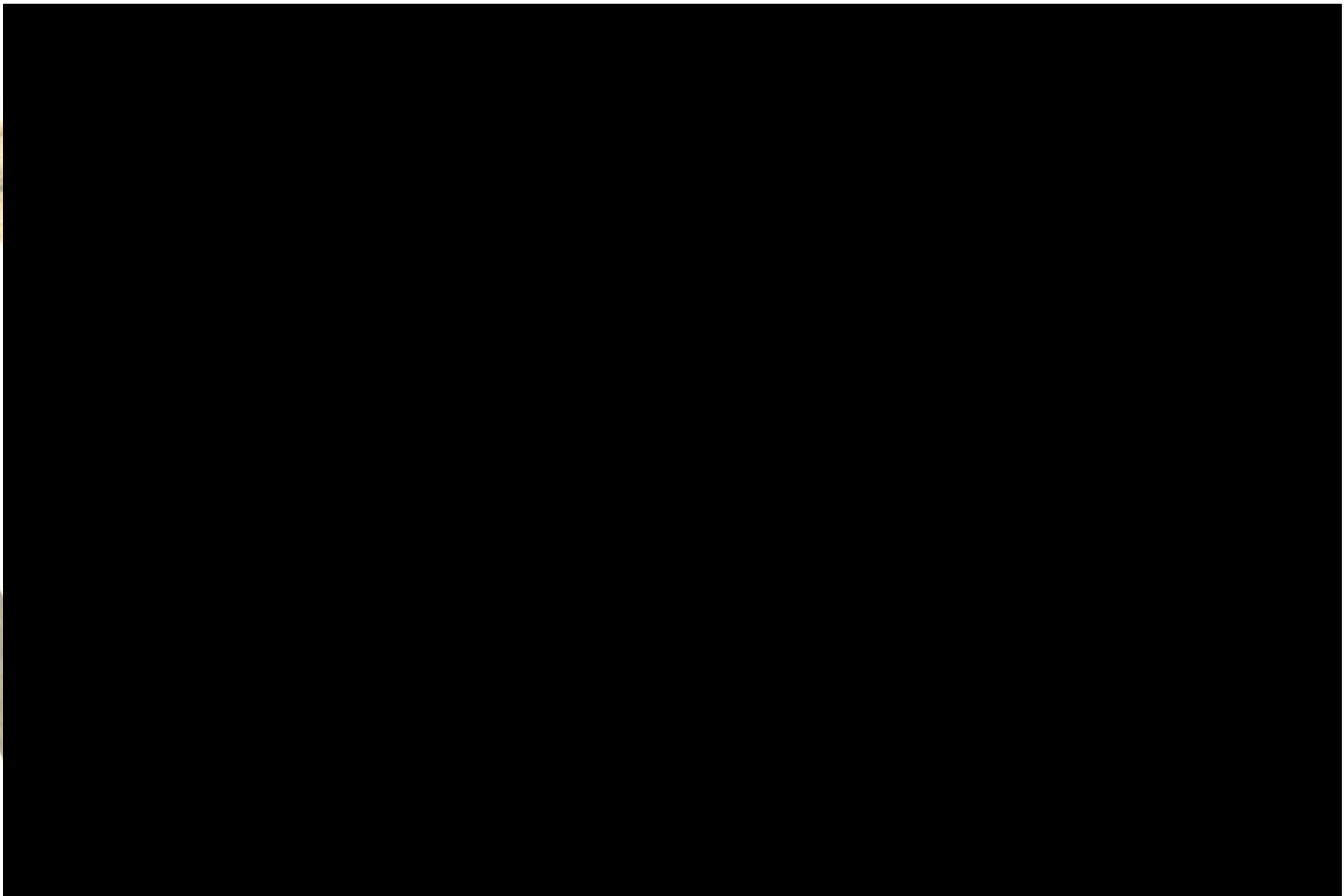


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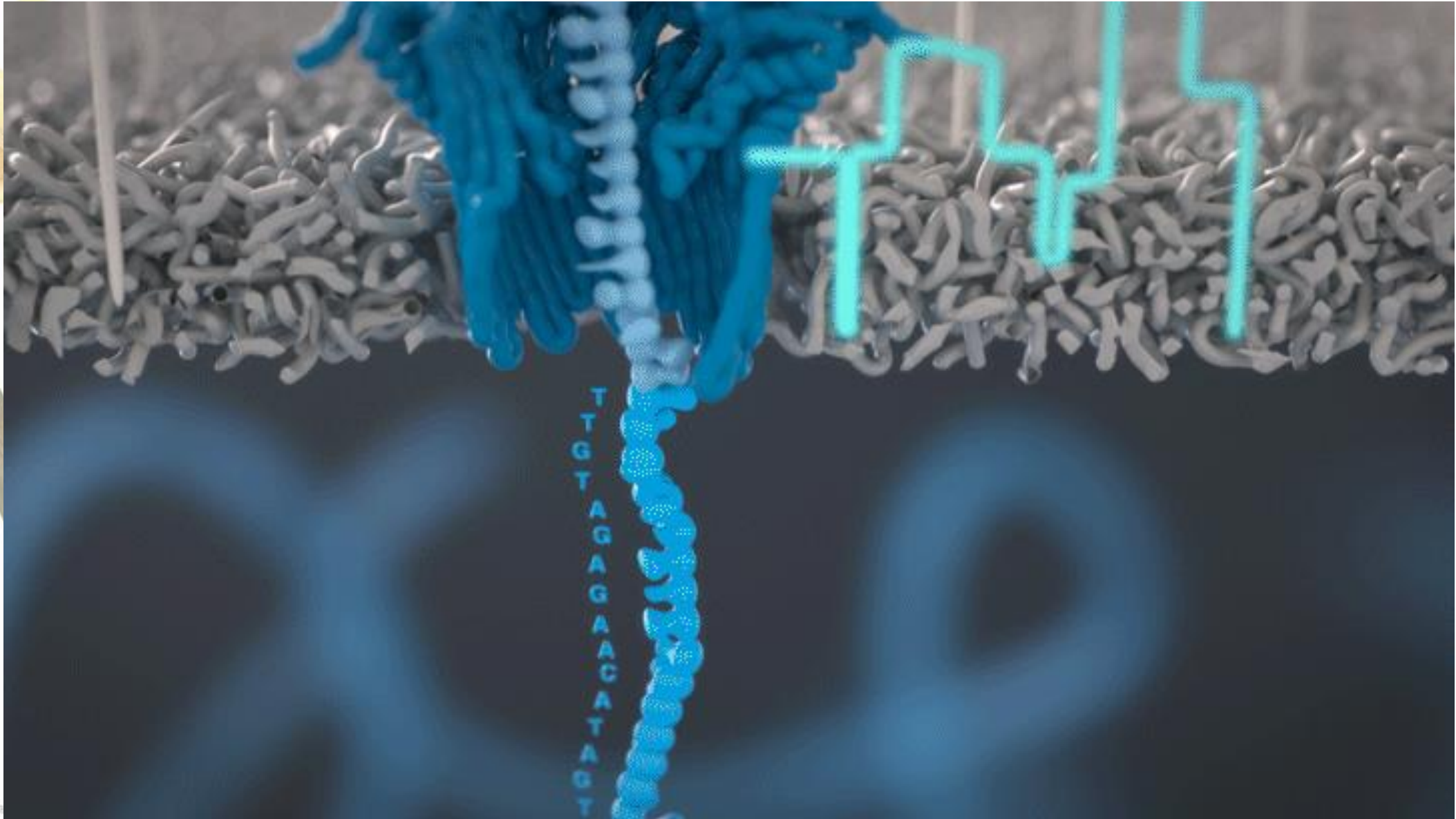
Methods



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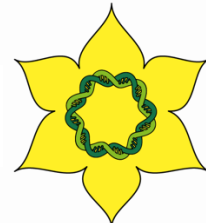
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Origin Story



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H 8136C
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Royal Society Partnership Grants

- Up to £3 000 to fund equipment (and some travel where necessary).
- Consists of 2 stages:
 - 1 – eligibility and suitability checks
 - 2 – the details which are then judged by a panel.

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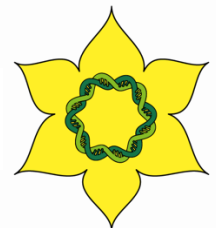
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