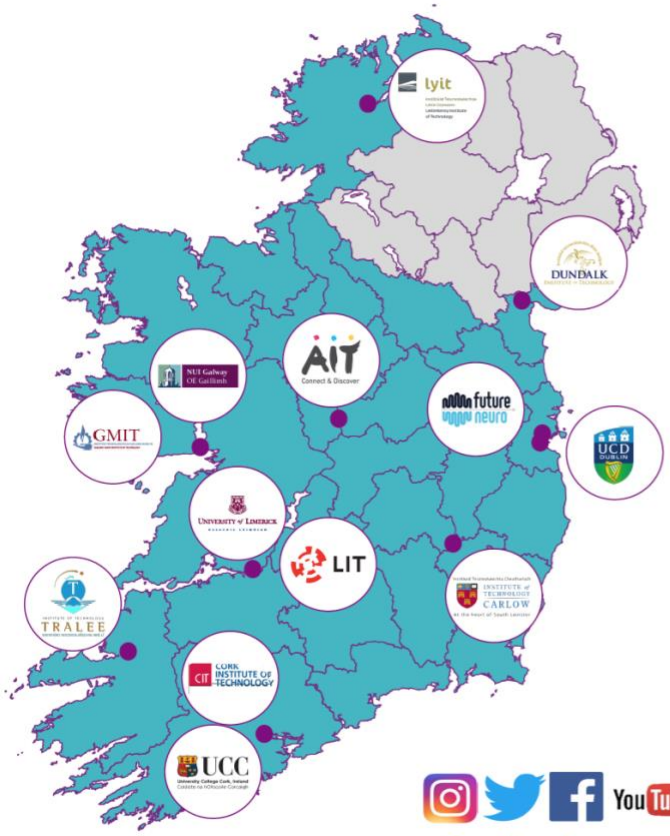
Cell EXPLORERS Summary report 2019

Cell EXPLORERS Summary reports 2019

Table of Content

The Cell EXPLORERS Network



cell EXPLORERS

Science Foundation Ireland sfi For what's next

National Network

It is made of 13 teams based in 15 Higher education Institutions and is funded by SFI and the HEI hosts.

International Contribution

Cell EXPLORERS is part of SCIENTIX, the community for science education in Europe.

SCIENTIX
The community for science education in Europe

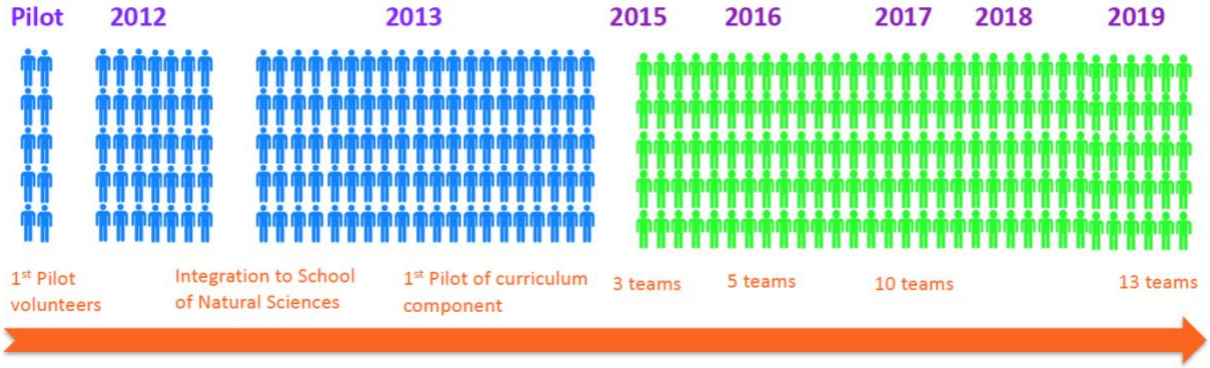
UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

The first international partner team is run by Dr. Doras Sibanda in the University of Kwatzulu-Natal in South Africa. The team is currently piloting the Fantastic DNA school visits. This collaboration is supported by NUI Galway and the Galway University Foundation.

NUI Galway OÉ Gaillimh | Galway University FOUNDATION

@cellexplorers
www.cellxplorers.com

Cell EXPLORERS expansion, reach & funding history



	Pilot	2012	2013	2015	2016	2017	2018	2019
Key events	1st Pilot volunteers		Integration to School of Natural Sciences	1st Pilot of curriculum component	3 teams	5 teams	10 teams	13 teams
Demonstrators	10	35	100	160	253	273	257	
Direct public Reach Per calendar year	30	490	2110	7100	6700	6100	6750	

Funding History

RDS Science Live | RDS | Science Foundation Ireland sfi For what's next | Biochemical Society Advancing Molecular Bioscience | xplore Innovation through student & staff collaboration | wellcome trust | ascb an international forum for cell biology | BIOCHEMICAL SOCIETY | SCIENCE WEEK | NUI Galway OÉ Gaillimh | Galway University FOUNDATION

Cell EXPLORERS working model

Volunteers
Students / Staff

Project students
Curricular based

Outreach & Public Engagement
School roadshow, festivals, online presence, exhibition…

Creation of educational resources

Impact Studies
- Evaluation
- Research

Engage local community

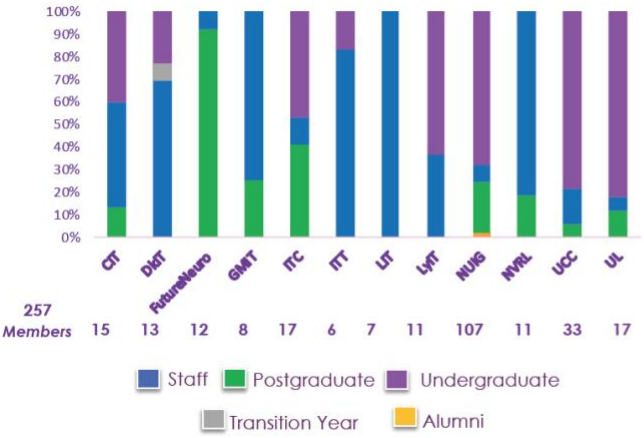
Multiple benefits of the programme

Community & Society (Public, schools, Civic Society, Industry, workforce)	Higher Education Institutions	Higher Education Students
• Interest in STEM • Awareness, attitudes, education & understanding of STEM and Research • Increase of science capital in families • Uptake of STEM subjects at secondary and third level • Best practice in informal science education	• Teaching • Research International visibility • Staff development • Community engagement • Funding	• Transferable skills • Graduate attribute Personal development • Engagement and leadership • Irish workforce trained at engaging in Science
	HEI mission	Train workforce and STEM advocates

12 Teams active in 2019

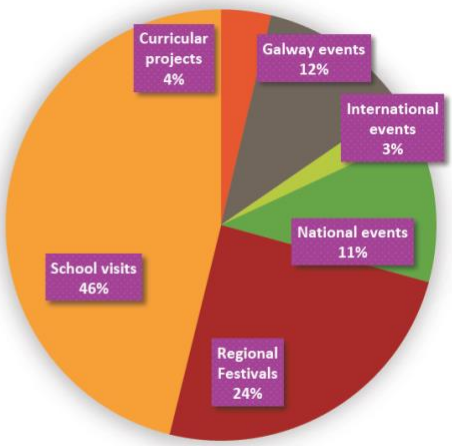
SFI Award 18DP5772

Team Composition



51 activities
6731 direct reach

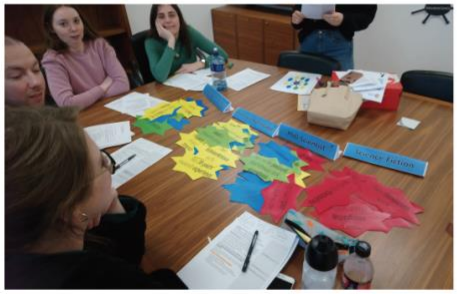
- **School visits:** 6 events reached 2959
- **Regional festivals:** **16** events reached 1575
- **Galway events:** 12 events reached 749
- **National events:** 10 events reached 718
- **Curricular projects:** 3 events reached 240
- **International events:** 4 events reached 170



Novel development by Final year projects

SFI Award 18DP5772

Revision of Fantastic DNA



Safety in the laboratory

Blackstone Launchpad project

Fantastic DNA in a box

xplore
Innovation through student & staff collaboration
Blackstone LaunchPad

Fantastic DNA Roadshow 2019

SFI Award 18DP5772

School visits delivery

- Letterkenny IT
- Dundalk IT
- NUI Galway
- GMIT
- NVRL-UCD
- Future Neuro
- Limerick IT
- UL
- IT Carlow
- IT Tralee
- UCC
- Cork IT

12 Active Teams

199 volunteers

77 Schools

23% Rural schools

23% DEIS schools

124 classes

3185 children

Feedback received from

40 teachers

1459 children

45% boys **53%** girls

Children & teachers report Fantastic DNA is a high-quality session

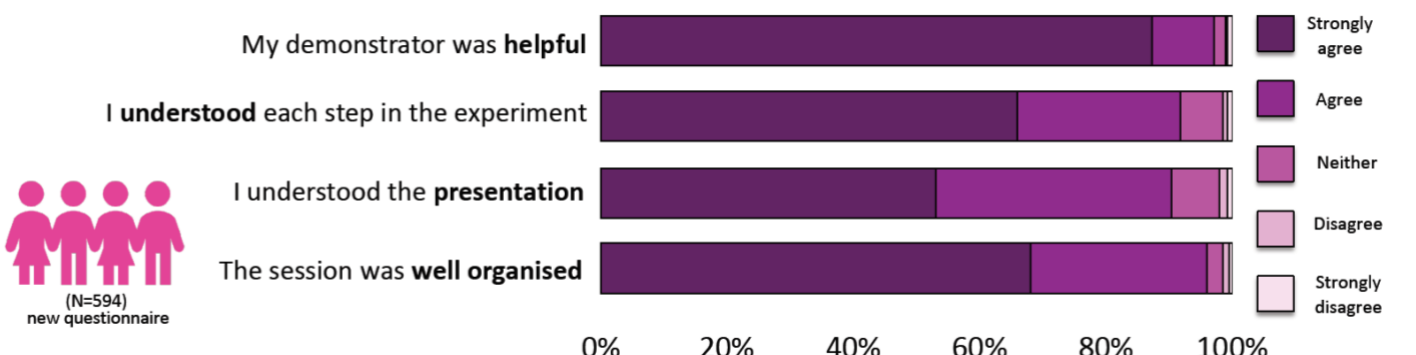
>93% reported that CE **outperformed** other E&PE groups on: (N=15)

- **Hands-on** science
- Use of **real scientific** equipment
- Child: Scientist **ratio**
- **Training** & organisation

"Cell EXPLORERS were much more organised & relaxed"

*"Cell EXPLORERS ensured **that every child has an opportunity** to do a hands on activity- others were predominantly demonstration based"*

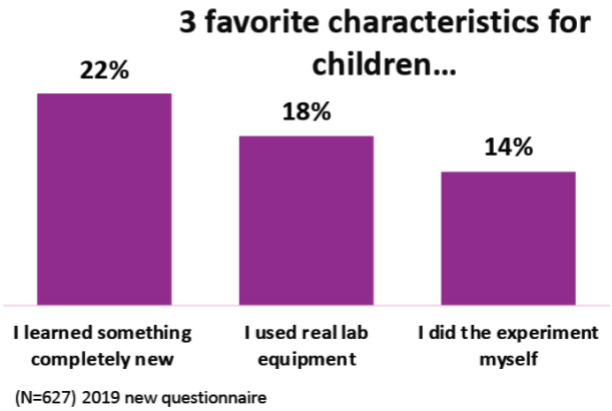
*"Cell EXPLORERS had **smaller groups**, more practical & used child self discovery"*



Fantastic DNA Roadshow 2019

SFI Award 18DP5772

Hands-on nature facilitates authentic science experience



...and teachers! (N=40)

1. The opportunity for each child to do an experiment (30%)
2. The small group interactions between the children and science demonstrators (18%)
3. The introduction to new science equipment and terms (12%)

Teachers describes the session positively impacts children's attitudes

"Very positive Increased interest in the area of science Never get to do "lab" work as such normally"

Top 6 impacts teachers reported on children

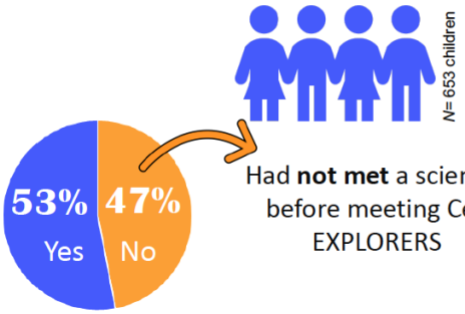
1. Increased interest in subject
2. Change of preconceptions
3. Understand/experience practical aspects
4. Understand the nature of science
5. Increased interest in career
6. Increased understanding of the relevance of science

(N=38)

"Very positive impact! The girls were very enthusiastic about science and have a better insight into the life of a scientist now!"

"A really positive experience. Good for the children to see so many female scientists. Some children said they wanted to be scientists. Awareness of different types of scientists. Attention to the correct way to conduct an experiment. "

Scientists in classroom supports children's social science capital



Had **not met** a scientist before meeting Cell EXPLORERS

Words used by children to **describe a scientist**

"They were nice people and they **helped me** a lot"

"I [liked] that they were **saying it clearly** and if you didn't do it right they would let you do it again"

Cell EXPLORERS Research Highlights

Galway University Foundation, NUIGalway
College of Science, SFI Award 18DP5772

PhD Project

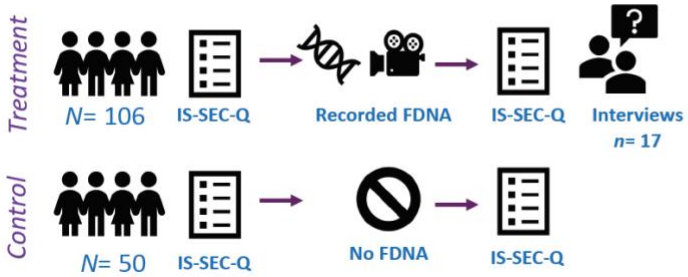
Sarah Carroll

The effect of Fantastic DNA on 6th class pupil's confidence to do science

What is the effect of Fantastic DNA on children's **science self-efficacy?**

Science self-efficacy = confidence to do science tasks

Study Design



Main Findings

1. Participation in Fantastic **DNA improves children's confidence** to do skills of the session (pipetting and filtering) and answering questions on Cells & DNA

2. Participation in Fantastic DNA increases children's reported exposure to two sources of self-efficacy provided by scientists: **Verbal Persuasion & Vicarious Experience**

3. Interviews suggest that children view **CE scientists as competent in science**, and their confidence in increased by the **positive atmosphere & helpful guidance** provided by the CE scientists

Postdoctoral Project

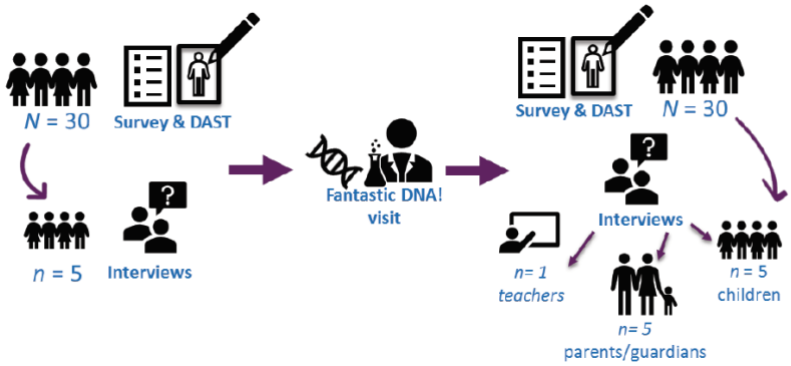
Tereza Brumovská

Effect of Fantastic DNA on pupils' perceptions of science & scientists

How does Fantastic DNA impact on children's **views of science & scientists?**

Study Design

Per participating class (4 x 6th classes in Galway)



Preliminary Findings

See SFI18DP5772 interim report 2019

1. 'Labcoat feeling' important contributor towards feeling like a **'real scientist'**

2. Performing **experimental work independently** is what 'really matters' to children

3. Study methods & analysis will be refined in a **second phase** to confirm and expand upon results

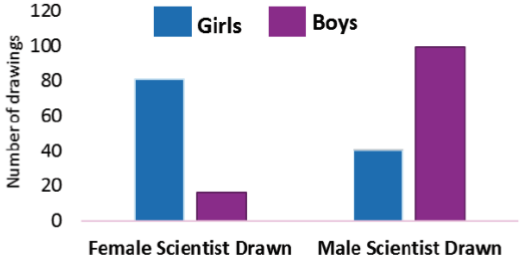
4th year research projects

Karen Douglas, Erica Cox, Ceola Walsh, Sarah Coyne

Children's drawings of scientists after Fantastic DNA

297 DAST drawings analysed

1. Children tend to draw **their own gender**



2. **Older children** draw more stereotypical scientists

Class Level	Self/Peer, CE Scientist, Teacher	Stereotypical Scientist, Other
3rd	41.60%	58.30%
4th	68%	32%
5th	45.59%	54.29%
6th	22.20%	77.70%

Cell EXPLORERS Highlights 2019

5 partner teams training




Active network running 7th Year of Fantastic DNA

Partners running visits & workshops









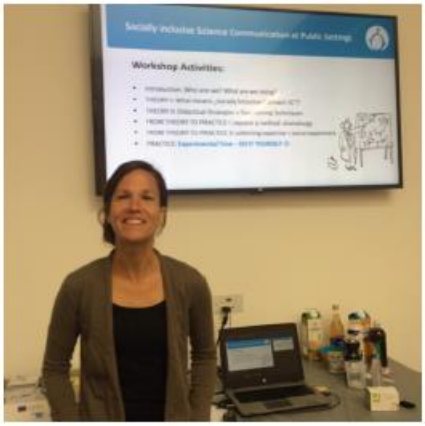
Big day out 2019

Scientix Teacher Training in Estonia

Fantastic DNA in a box

SFI STEM communication award

Inclusivity in public engagement in Science with Joahna from Kinderbüro



2nd network meeting

Final year projects

Tereza starts the research pilot on children attitudes to scientists

Sarah's presentation at ESERA 2019

KatzuluNatal CE pilot visit

Native Scientist: atelier de science en Français