



National Children's Research Centre

2020 In Review



NATIONAL CHILDREN'S
RESEARCH CENTRE



**Message from
our CEO, Dr.
Jacinta Kelly**

Dear Colleagues,

I think we can safely look back on 2020 as a year like no other. From the initial concerns about the emergence of a new viral infection, to a full pandemic of COVID 19 and a sequence of unprecedented restrictions that impact on every aspect of our lives.

Despite this, a huge amount of work has been successfully going on during this time, by NCRC funded researchers and staff within our building, in the laboratories of partner Institutes, and by staff working from home. Some of this work is highlighted here, and further examples are to be found on our website and in the recent NCRC Highlights of the past year. I would like to add my sincere thanks to everyone who has made this possible, and have been asked by Ruth Barrington, Chair of the NCRC Board, to convey additionally the thanks of the Board to everyone concerned. None of this would be possible without the tremendous support of the Children's Health Foundation, the long-term funders of the NCRC.

We've learned a lot about ourselves and our adaptability in this time period. What has also been fascinating is the now common use of terms normally reserved for laboratory scientists, such as PCR, mRNA, DNA mutations, antigen testing, viral spike proteins, antibody and T cell responses. The pandemic has highlighted to global audiences, that fundamental scientific research, taking place internationally, can and does contribute to improvements in health and is worth investing in. I hope you enjoy this snapshot of NCRC work at the end of 2020.

I would also like to take this opportunity to wish everyone a very Happy Christmas, and a safe and healthy New Year.

Jacinta Kelly

Research Grants Statistics in 2020

In 2020, the NCRC had 69 active research grants, providing support for over 100 paediatric researchers in Ireland. These grants funded research projects on a wide range of common and rare childhood conditions including Childhood Cancer, Congenital Heart Disease Cystic Fibrosis, Eczema, Inflammatory Bowel Disease, Diabetes, Tuberculosis, Malaria, Sickle Cell Anaemia, Mumps, Behçet's Disease, Arthritis, Scoliosis, Childhood Obesity, Premature birth, Neonatal brain injury, Neonatal sepsis, Respiratory distress, & subglottic stenosis. We continue to strive in our mission to support internationally competitive, high quality research that makes a lasting improvement to the lives of children.

2 Leadership Awards

34 Paediatric Research Project Grants

3 Innovation Awards

16 Clinical Research Fellowships

9 Research Education Support Grants

5 Partnership Awards

69

Active Grants

60

% of Grants held
by female lead
applicants

7

Irish Universities
with NCRC
Grants (NUIG,
NUIM, RCSI, UCD,
TCD, UL, UCC)

100 +

Researchers
supported across
all grants

13

National and
International
Hospitals
involved in NCRC
research

New Research Grants in 2020

5

New
Research
Grants in
2020

1

Is childhood obesity compromising vaccine responses?

Principal Investigator: Dr. Andy Hogan

Co-Investigators: Prof. Declan Cody, Dr. Cillian De Gascun

Host Institute: Maynooth University

2

Novel therapeutic approach to counter vaso-occlusive crisis in sickle cell disease using engineered activated protein C

Principal Investigator: Dr. Roger Preston

Co-Investigators: Dr. Michelle Lavin, Prof. Corrina McMahon

Host Institute: Royal College of Surgeons in Ireland

3

Fetal programming of childhood cardiometabolic health and obesity: ROLO PreTeen Study

Principal Investigator: Prof. Fionnuala McAuliffe

Co-Investigators: Dr. Aisling Geraghty, Dr. Eileen O'Brien, Prof. Declan Cody

Host Institute: University College Dublin

4

Development of patient-specific bioresorbable paediatric 3D printed vascular stents for the treatment of aortic coarctation

Principal Investigator: Dr. Eoin O'Cearbhaill

Co-Investigators: Prof. Colin McMahon, Dr. William Ronan, and Prof. Kevin Walsh

Host Institute: University College Dublin

5

Development of a physiotherapy screening tool for paediatric joint hypermobility: A move towards targeted treatment.

Clinical Research Fellow: Ms Susan Ward

Academic Supervisor: Dr. Sarah Dockrell

Clinical Supervisor: Dr. Emma Jane McDermott

Host Institute: Trinity College Dublin

NCRC supported research in 2020

> 150
publications by
NCRC affiliated
researchers in
2020*

> 6000
citations of
publications by
NCRC affiliated
researchers in
2020*

Most cited publication by an NCRC affiliated researcher in 2020*

H Fogarty L Townsend CI Ni Cheallaigh C Bergin I Martin-Loeches P Browne C L. Bacon R Gaule A Gillett M Byrne K Ryan N O'Connell J M. O'Sullivan N Conlon, J S. O'Donnell. COVID19 coagulopathy in Caucasian patients. *British Journal of Haematology*, 2020, 189, 1044–1049

Most cited publication by an NCRC affiliated researcher to date*

A Irvine, I McLean, and D Leung. Filaggrin Mutations Associated with Skin and Allergic Diseases. *New England Journal of Medicine*. 2011; 365:1315-1327

Severe Neurological Impairment: A delphi consensus-based definition

John Allen ^{a,b,c,*}, Maria Brenner ^{c,d}, Julie Hauer ^e, Eleanor Molloy ^{a,b,c,f,g,h}, Denise McDonald ^{a,b,c}

A review of the role of extracellular vesicles in neonatal physiology and pathology

Claire A. Murphy [✉], Daniel P. O'Reilly, Elaine Neary, Afif EL-Khuffash, Fionnuala NíAinle, Naomi McCallion & Patricia B. Maguire

A novel *RELA* truncating mutation in familial Behçet's Disease-like mucocutaneous ulcerative condition.

Fahd Adeeb, Emma R. Dorris [✉], Niamh E. Morgan, Dylan Lawless, Aqeel Maqsood, Wan Lin Ng, Orla Killeen, Eoin P. Cummins, Cormac T. Taylor, Sinisa Savic, Anthony G. Wilson, Alexander Fraser

A Context-Dependent Role for MiR-124-3p on Cell Phenotype, Viability and Chemosensitivity in Neuroblastoma *in vitro*

John C. Nolan^{1,2*}, Manuela Salvucci³, Steven Carberry³, Ana Barat³, Miguel F. Segura⁴, Justine Fenn¹, Jochen H. M. Prehn³, Raymond L. Stallings^{1,2} and Olga Piskareva^{1,2,5*}

transcriptomic continuum of differentiation arrest identifies myeloid interface acute leukemias with poor prognosis

nathan Bond^{1,2,3,4}, Aleksandra Krzywon^{5,6,7,8}, Ludovic Lhermitte^{1,2}, Christophe Roumier^{9,10}, Anne Roggy^{1,2,11}, oshamed Belhocine^{1,2}, Alexander Abdulkader Kheirallah^{5,6}, Patrick Villarese^{1,2}, Guillaume Hypolite^{1,2}, ancine Garnache-Ottou¹¹, Sylvie Castaigne^{1,2}, Nicolas Boissel¹³, Vahid Asnafi^{1,2}, Claude Preudhomme^{9,10}, rrvé Dombret¹³, Elisa Laurenti^{5,6}, Elizabeth Macintyre^{1,2}

NADPH oxidase 4 is protective and not fibrogenic in intestinal inflammation

Emily Stenke^a, Gabriella Aviello^{a,1}, Ashish Singh^a, Sean Martin^b, Des Winter^b, Brian Sweeney^c, Michael McDermott^c, Billy Bourke^{b,c}, Seamus Hussey^{c,d}, Ulla G. Knaus^{a,c,*}

Efficacy and safety of oral immunotherapy with AR101 in European children with a peanut allergy (ARTEMIS): a multicentre, double-blind, randomised, placebo-controlled phase 3 trial

A Pilot Randomized Controlled Trial of Early Targeted Patent Ductus Arteriosus Treatment Using a Risk Based Severity Score (The PDA RCT)

Notable Events in 2020



Dr. Jaythoon Hassan

Dr. Jaythoon Hassan of the UCD National Virus Reference Laboratory and UCD Centre for Experimental Pathogen Host Research who recently won the Irish Lab Award's Laboratory Scientist of the Year Award. Jaythoon is funded through the NCRC's Paediatric Research Project Grant scheme to study mumps outbreaks in highly vaccinated populations and featured as our researcher of the month in July

Graduations

A number of NCRC funded researchers graduated in 2020. Dr. Mary Isabel O'Dea was awarded a PhD for her research on the UNICORN study. Dr. Neidin Bussman was awarded a PhD for her research on "*A Randomised Controlled Trial of Early Targeted Patent Ductus Arteriosus Treatment Using a Risk Based Severity Score*". Dr. Dean Huggard was awarded a PhD for his research on the DINOSAUR study.

New NCRC staff in 2020

Lisa Byrne – Quality and Regulatory Affairs Officer CCRU

Deirdre Byrne – Paediatric Research Nurse CCRU

Aileen Molloy – Paediatric Research Nurse CCRU

Breda Kane – Paediatric Research Nurse CCRU

Claire Hyland – Senior Clinical Research Coordinator CCRU

NCRC Researchers in Focus 2020

Throughout the year, we highlighted the exciting work NCRC funded researchers are undertaking in our monthly Researcher in Focus series

January – Dr. Aisling Garvey

February – Dr. Brona Murphy

March – Dr. Andy Hogan

April – Dr. Karen Conlan

May – Dr. Amanda Fitzgerald

June – Prof. Imelda Coyne

July – Dr. Jaythoon Hassan

August – Dr. Roger Preston

September – Prof. Jonathan Bond

October – Dr. Mary Isabel O'Dea

November – Prof. Seamus Hussey

December – Prof. Tracy Robson

and Dr. Stephanie Annett

NCRC Annual Symposium

In response to COVID-19, the NCRC annual symposium went online in 2020 with a series of online seminars from our funded researchers in December

Dr Olga Piskareva and Dr Cormac Owens presented work from their NCRC Paediatric Research Project Grant 'Biomarkers of chemotherapy response in patient with aggressive neuroblastoma'.

Professor Catriona Lally and Professor Damien Kenny presented work from their NCRC Innovation Award 'Made to measure – 3D printed paediatric stents'

Dr Madeleine Murphy presented her research on 'Studies of breathing support and monitoring in newborn infants'.

Dr Yvonne D'Art presented her research on 'Single dose food challenges in diagnosis and management of cow's milk allergy in infants'

Message from
Mary Costello,
Children's
Clinical Research
Unit Programme
Manager

2020 has been an extremely busy and hugely productive year for the CCRU despite the COVID-19 pandemic. Every effort has been made to keep clinical trials running throughout the different phases of restrictions, with the team rapidly adapting their working practices to maximise activities that could be carried out remotely. Their dedication, flexibility and composure under pressure has really been extraordinary.

Supported by **Vinny O'Mahony** and **Jenny Lennon**, the team of Research Nurses and Coordinators have been coming onsite as required, working under challenging conditions to ensure research study activity has safely continued.

Our Trials Pharmacist **Anmarie Brogan** has played a key role throughout, working across both Crumlin and Temple Street sites to support trial IMP management. We also had a number of new team members start – **Claire Hyland, Breda Kane, Deirdre Byrne, Karen Lester, Rachel Cregan** and **Anna McCabe** in Clinical Operations and **Lisa Byrne** in Quality & Regulatory Affairs. As well as supporting 28 clinical trials and 28 non-interventional research studies during this period, we have been heavily occupied with follow-up from the HPRAs systems inspection in January. Also, in the background, we have been working on the planning and preparations for the future integration within CHI and setup of the new Research & Innovation Office.

**Message from
Celine Nic
Oireachtaigh
Head of
Communications
at CHF**



At the start of 2020, the team at Children's Health Foundation was excited about the opportunities to support sick children and their families across CHI sites, as well as raising vital funds for research. This year has been incredibly challenging and is like nothing we have ever witnessed before. It has been a very uncertain time for everyone, especially for those on the front-lines.

Children's Health Foundation believes that supporting research is crucial to improving care and finding new cures. To fulfil this objective, the total granted by the Foundation to NCRC in 2020 is expected to be around €4.9m of which nearly €2m is being invested across active Leadership awards, Paediatric Research Project Grants, Innovation Awards and partnerships. €872k is being invested in 16 active Clinical Research Fellowships. Another €650k is expected to fund the Children's Clinical Research Unit, and over €150k the laboratory.

Over the course of 2020, Children's Health Foundation worked harder than ever to continue its mission to raise vital funds to support paediatric healthcare and research. To support our front line workers during the COVID-19 crisis we launched an emergency appeal in April, 'Together With Our Heroes'. The response to this appeal was extremely heartening, with individuals, companies and organisations across the country donating funds, toys and goods to support patients, families and staff in CHI hospitals and urgent care centres.

Through the challenging months that this year has presented, we have seen many of our supporters coming up with creative and socially distanced fundraising ideas. We have had song releases, running challenges, virtual marathons, the World's first indoor Ironman challenge, dips in the sea, jewellery making, bake sales and so much more. We are immensely grateful to them for stepping up when we needed them most, to raise much-needed, urgent funds.

Children's Health Foundation's annual calendar of events was affected by the COVID-19 crisis in many ways, with a large number of events cancelled, deferred or postponed. In response, our team devised new, creative ways to fundraise on behalf of sick children including 'High Five FUNdraisers' and '150km Your Way' challenges. Our long-standing 'Great Irish Bake', '100minds', 'Trick or Treat' and 'National Christmas Jumper Day' activities all took place with new ways to get involved in a safe and socially-distanced way.

These activities have been vital to help us continue to support CHI and research. Although our number of supporters have grown and virtual fundraising has also grown this year, we have seen a reduction in our overall income and in the average gift from the virtual fundraising versus in-person fundraising.

Despite a challenging year, Children's Health Foundation continues to be committed to raising funds for paediatric research and initiatives to improve the lives of sick children and whilst we know the coming year is going to prove challenging again, we will rise to that challenge.

We would like to take this opportunity to wish all the staff and affiliates of the NCRC a Merry Christmas and healthy Happy New Year.

The NCRC doing Whatever It Takes!



Olga Piskareva and the **Cancer Bioengineering group** at RCSI (left) took on the "10 Laps 10km" challenge for Childhood Cancer Awareness 2020 and raised a grand total of €1419 for Children's Health Foundation Crumlin (formerly CMRF), the Conor Foley Neuroblastoma Cancer Research Foundation, and Neuroblastoma UK. On completion of the challenge, Olga said *"We were over the moon with this sum, as 2020 required a very different kind of fundraiser than previous years. Our three chosen charities each received just over €470. We'd like to say a big thank you to everyone who donated. It will make a huge difference for these charities, this year especially, paving the way to better treatment options for children with cancer in the future"*.



Our Research Grants Manager **Karl Egan** (right) took part in the Children's Health Foundation Crumlin Tour De County challenge. He cycled 2020km around Wicklow in July & August raising €600 for CHF Crumlin.

