

Research Methods Deserve Credit and Recognition as a Valuable Research Output

Munin Conference on Scholarly Publishing – Nov 2020

Emma Ganley PhD, Director of Strategic Initiatives

@GanleyEmma | emma@protocols.io

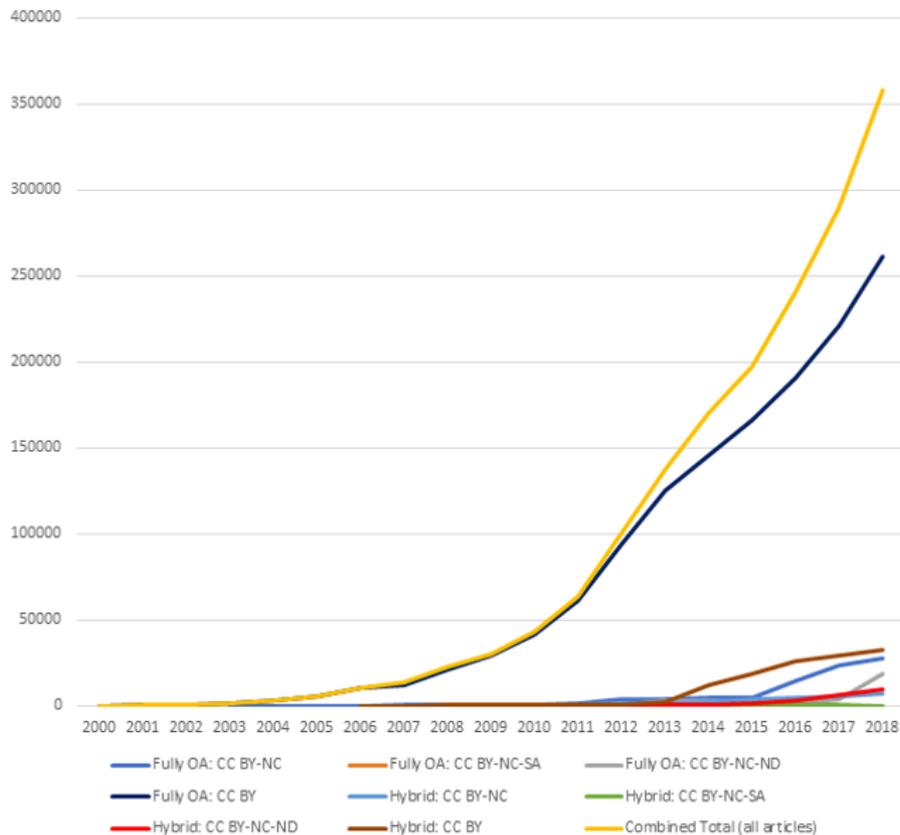




Meandering Toward Open Research



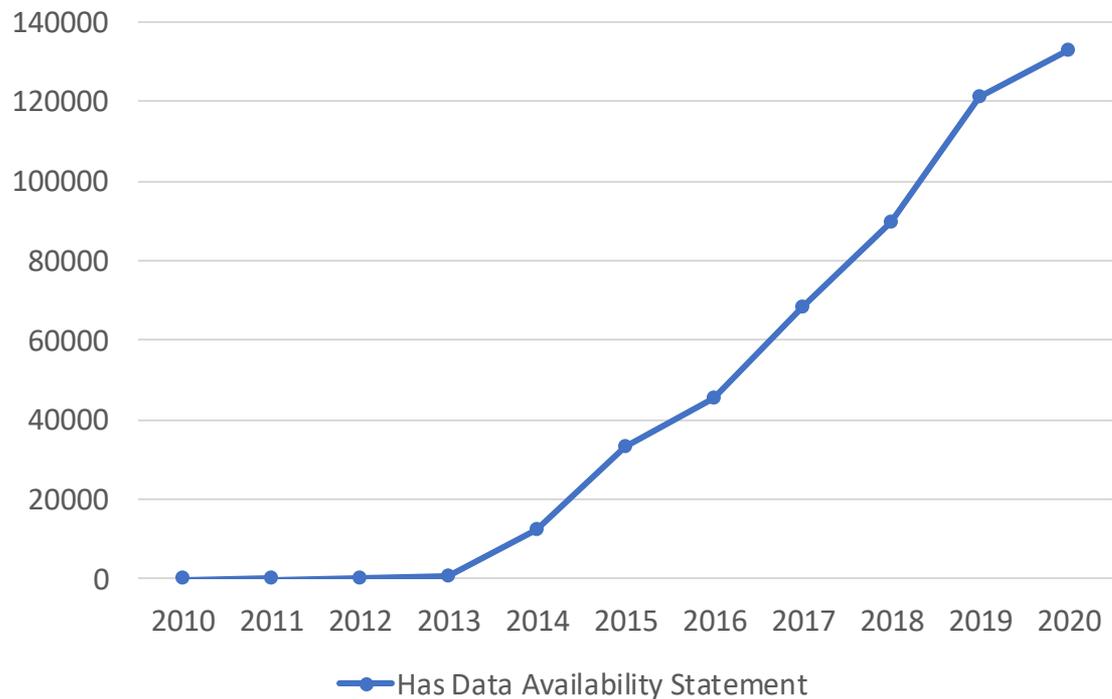
Chart 1: Open Access Articles Published by OASPA Members:
Different CC licenses in fully OA and hybrid journals



OA Growth



Articles in PMC with Data Availability Statement



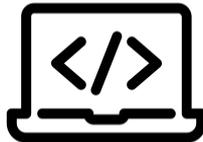
Open Data





Amanda Wray, US

Code



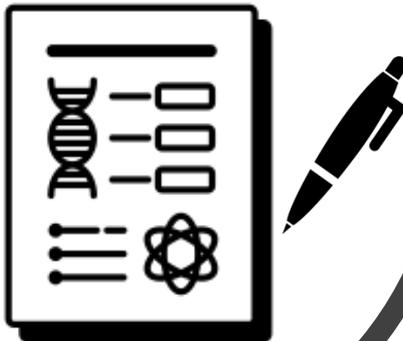
Gregor Cresnar



nareerat.jalkaew, TH

Data

Research Articles

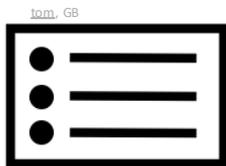


Lisole

Becris



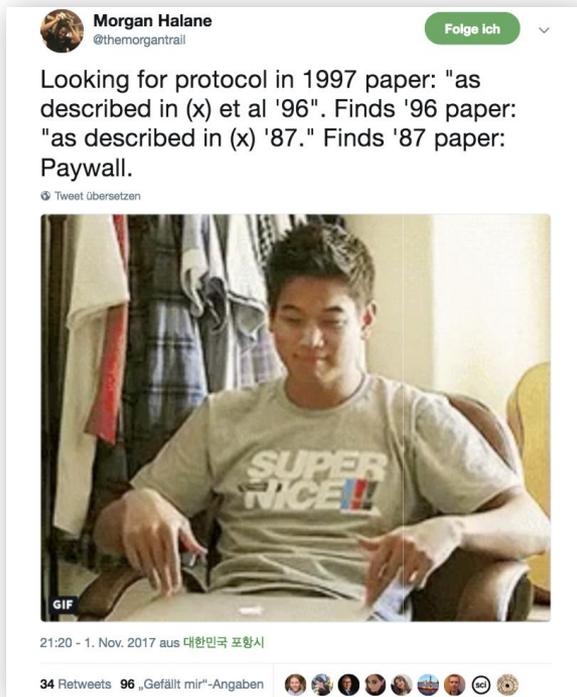
Methods??



tom, GB

Citations (& Abstracts)

Methods for Reproducible Research



The Brick Wall / Wild Goose Chase

Researchers cannot:

- find,
- access, or
- replicate...
... the methods

Daniel Gonzales
@dgonzales1990 Folge ich

2017: “Devices were fabricated as previously described [ref 8]”

[ref 8] 2015: “Devices were fabricated as previously described [ref 4]”

[ref 4] 2013: “Devices were fabricated as previously described [ref 2]”

[ref 2] 2009: “Devices were fabricated with conventional methods”

[Tweet übersetzen](#)

13:16 - 17. Jan. 2018

230 Retweets 798 „Gefällt mir“-Angaben

28 230 798

The Methods Status Quo

The Cancer Reproducibility Project



- Planned to Replicate 50 Cancer Studies
- Replication of Only 18/50 Attempted
- A “Hopeless Slog”
- Insufficient Methods Details Available

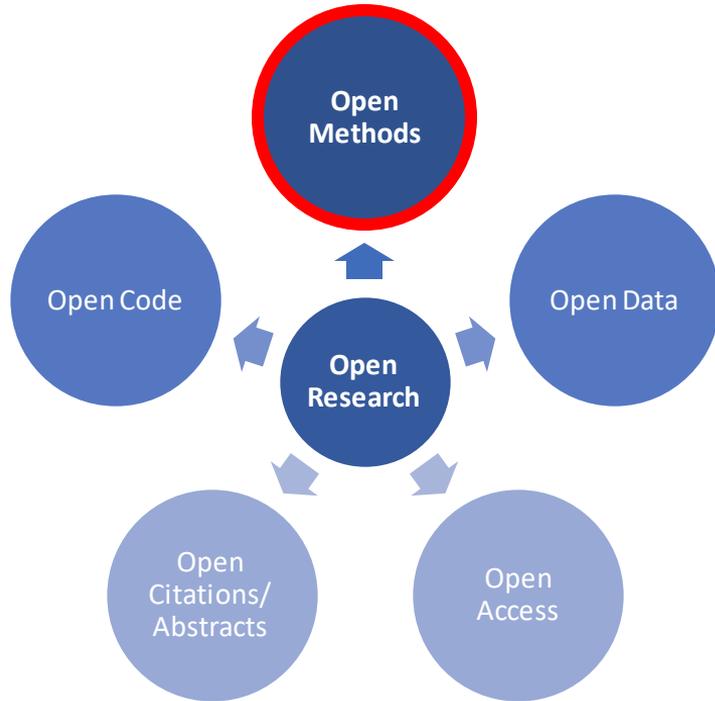
The Atlantic

**How Reliable Are Cancer
Studies?**

January 18, 2017

*“The hardest part, by far, was figuring out exactly what the original labs actually did. Scientific papers come with methods sections that theoretically ought to provide recipes for doing the same experiments. **But often, those recipes are incomplete, missing out important steps, details, or ingredients. In some cases, the recipes aren’t described at all; researchers simply cite an earlier study that used a similar technique.**”*

Open Research Requires Open Methods



Methods are potentially **the single most important element needed to replicate and reproduce research**, and they must be available for research to truly be Open Research.

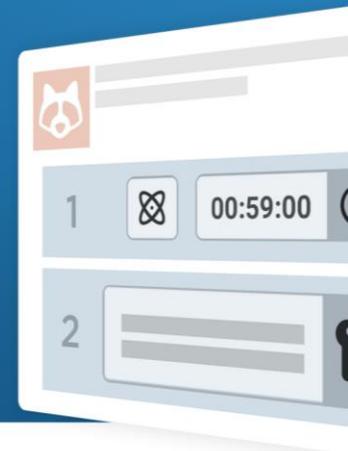
New monthly protocols: >1000
Total public protocols: ~9,000
Total private protocols: ~30,000

Bring structure to your research

A secure platform for developing and sharing reproducible methods.

biology chemistry computational workflows clinical trials
operational procedures safety checklists instructions / manuals

FEATURES



Methods for Methods

- OA Repository (CC BY)
- Free to Publish
- Diversity of Disciplines
- Archived & Mirrored
- Public API
- PDF and JSON

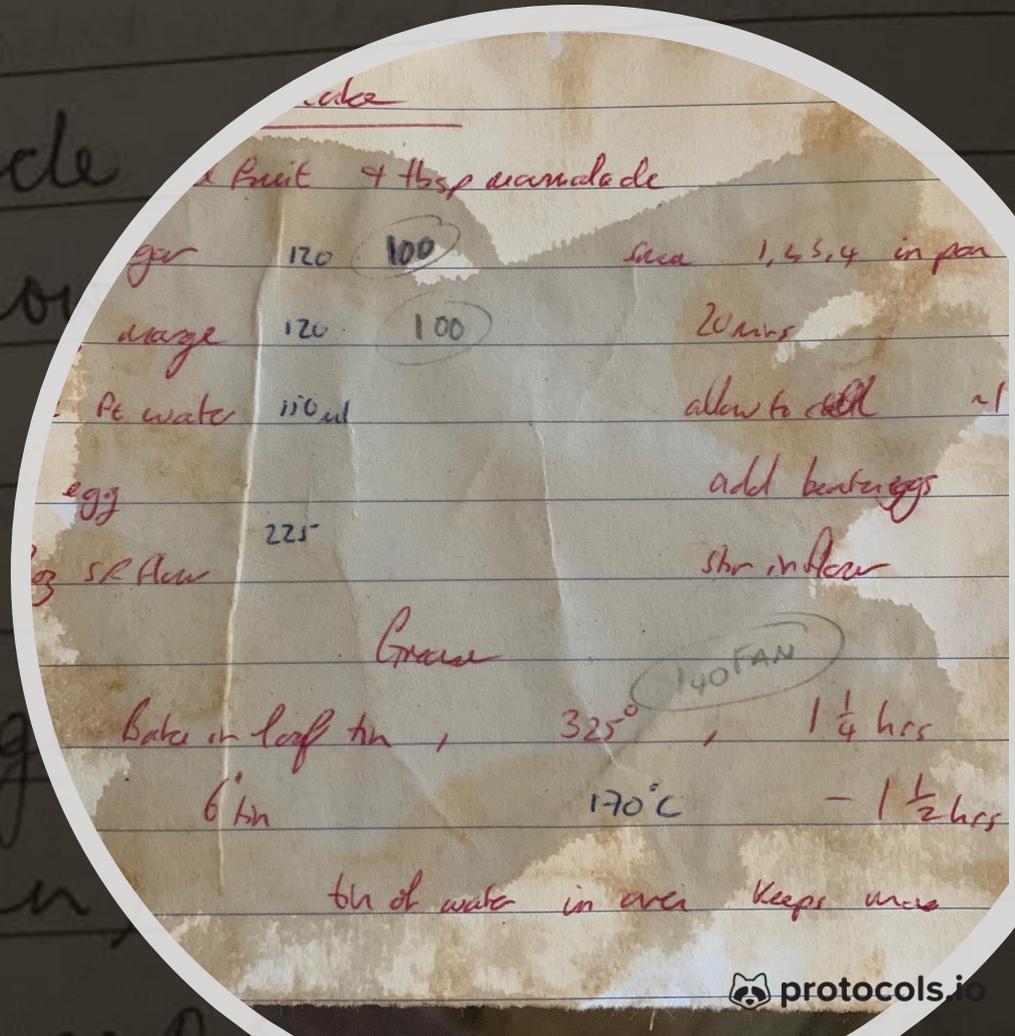
Featured protocols

SABER-FISH – Signal amplification for multiplexed ...
Jocelyn Y. Kishi, Sylvain W. Lapan, Brian J. Beliveau, Emma R. West, Allen Zhu, Hiroshi ...

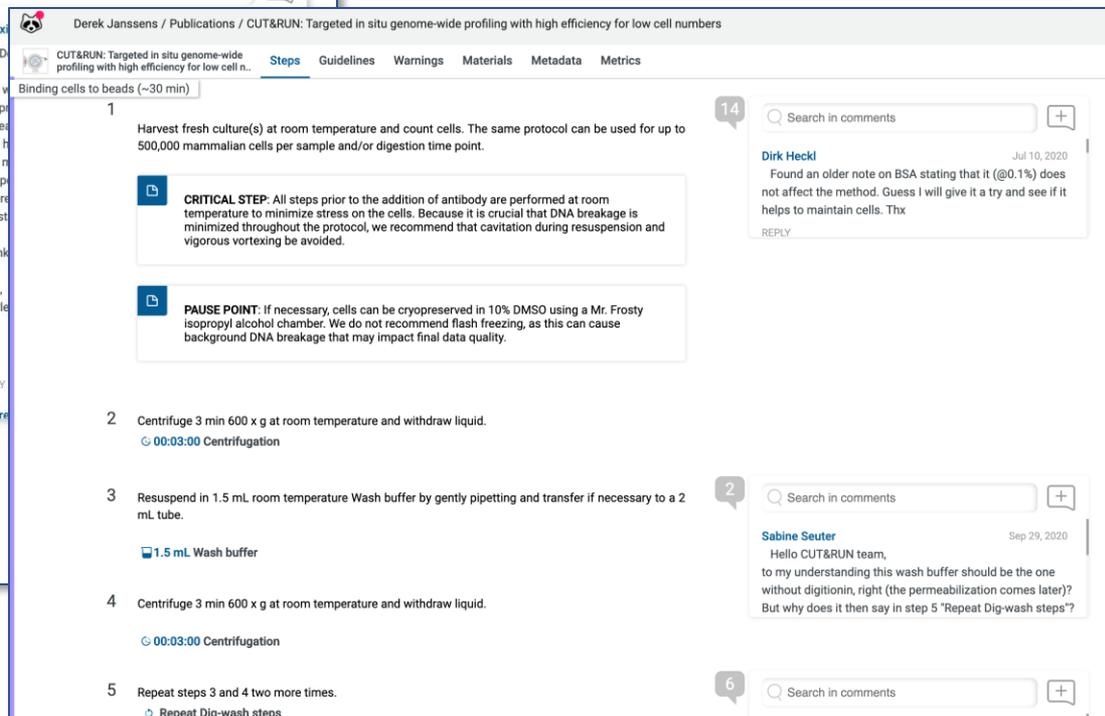
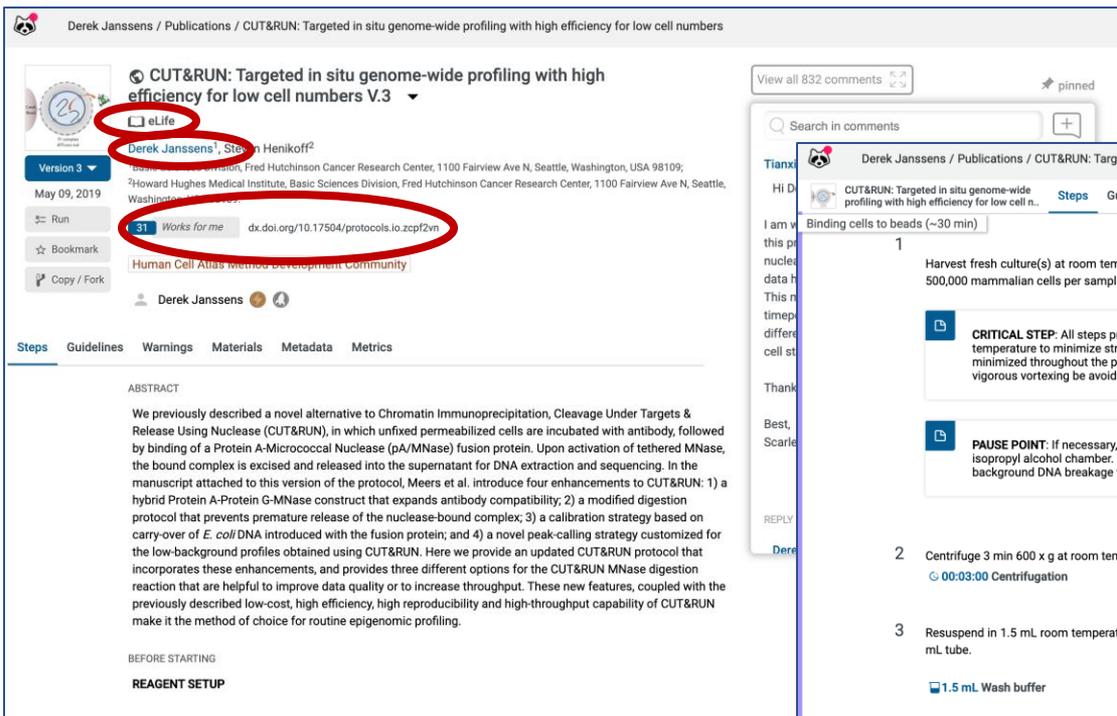
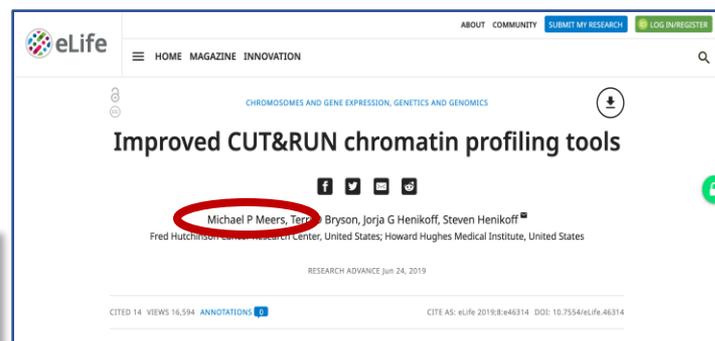
HTAPP_Dissociation of human primary lung cancer resectio...
Michal Slyper, Avinash Waghray, Julia Waldman, Isaac Wakiro, Mei-Ju Su, Sébasti...

SARS-CoV-2 Illumin protocol v.1
Public Health Ontario

From Old
Handwritten
Recipes...



...to Structured Protocols



Published Protocols Appear on your ORCID Record



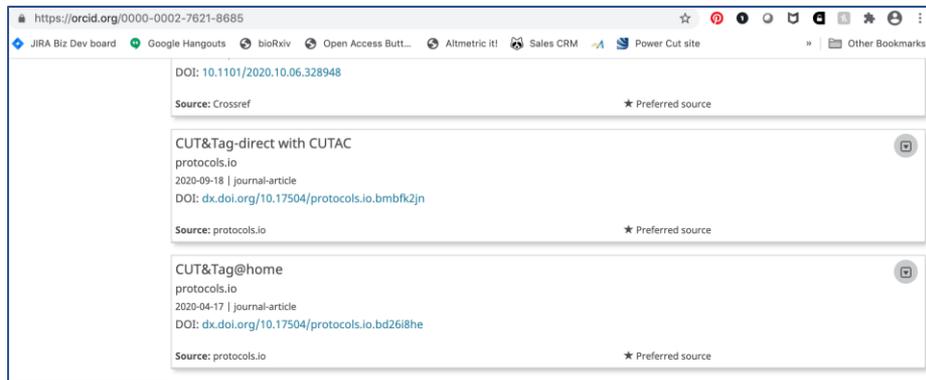
Connecting your ORCID ID with your protocols.io account allows protocols.io to post information about your published protocols onto the Works section of your ORCID record.

ORCID IDs are unique identifiers assigned to individual scholars and researchers. Using an ORCID allows your manuscripts, grants, and other scholarship to be more discoverable and integrated within larger research networks.

Click the button below to connect your ORCID ID to your protocols.io account.
You can also create and connect a new ORCID ID (if you don't have one)



<https://www.protocols.io/orcid>



<https://orcid.org/0000-0002-7621-8685>

Dynamic Permanence of Published Protocols

PLOS BIOLOGY

OPEN ACCESS PEER-REVIEWED
RESEARCH ARTICLE

Commensal bacteria and essential amino acids control food choice behavior and reproduction

Ricardo Leitão-Gonçalves, Zita Carvalho-Santos, Ana Patrícia Francisco, Gabriela Tondolo Fioreze, Margarida Anjos, Célia Baltazar, Ana Paula Elias, Pavel M. Itskov, Matthew D. W. Piper, Carlos Ribeiro

Published: April 25, 2017 • <https://doi.org/10.1371/journal.pbio.2000862>

Article	Authors	Metrics	Comments	Media Coverage
Abstract	Abstract			

“Methods and protocols for... are available as a collection in protocols.io [DOI link]”

Carlos Ribeiro / Publications / Methods and protocols from Goncalves et al. (2017) for manipulating the diet and the microbiome of Drosophila

Methods and protocols from Goncalves et al. (2017) for manipulating the diet and the microbiome of Drosophila V.1

PLOS Biology

Zita Santos¹, Patrícia Francisco¹, Margarida Anjos¹, Célia Baltazar¹, Ana Paula Elias¹, Gabriela Tondolo Fioreze¹, Pavel M. Itskov¹, Matthew D. W. Piper¹, Carlos Ribeiro¹

¹Champalimaud Centre for the Unknown, School of Biological Sciences

Apr 25, 2017

[dx.doi.org/10.17504/protocols.io.hdtb26n](https://doi.org/10.17504/protocols.io.hdtb26n)

Ribeiro Lab

Carlos Ribeiro
Champalimaud Centre for the Unknown

Abstract Protocols Metadata Metrics

There is a newer version of this collection available. [VIEW THE NEWER VERSION](#)

ABSTRACT

This is a collection of methods and protocols from the manuscript: [Goncalves et al. Commensal bacteria and essential amino acids control food choice behavior and reproduction. Plos Biology. 2017 Apr 18.](#)

Abstract nutritional–microbial–behavioral interactions and suggest the intriguing possibility that commensal bacteria influence behavior and brain function in invertebrates and vertebrates by tapping into the nutrient-sensing abilities of the nervous system.

Author summary

Introduction

Results

Discussion

Materials and methods

Supporting information

Acknowledgments

References

Materials and methods

Methods and protocols for Drosophila rearing, media preparations, and microbial manipulations are available as a collection in protocols.io [dx.doi.org/10.17504/protocols.io.hdtb26n](https://doi.org/10.17504/protocols.io.hdtb26n).

Drosophila stocks and genetics

Unless stated otherwise, all experiments were performed with mated w^{1118} female flies. Ubiquitous (*tubulin-Gal4* [89]), pan-neuronal (*elav-Gal4* [90]), tracheal (*bt1-Gal4* [91]), or fat body (*Cg-Gal4* [92], BL #7011) expression of RNAi delivering transgenes against *Henna* (CG7909) was achieved by crossing Gal4 carrying female flies with three independent UAS

Carlos Ribeiro / Publications / Methods and protocols from 2017 Leitão-Gonçalves et al. for manipulating the diet and the microbiome of Drosophila

Methods and protocols from 2017 Leitão-Gonçalves et al. for manipulating the diet and the microbiome of Drosophila V.2

PLOS Biology

Zita Santos¹, Patrícia Francisco¹, Margarida Anjos¹, Célia Baltazar¹, Ana Paula Elias¹, Gabriela Tondolo Fioreze¹, Pavel M. Itskov¹, Matthew D. W. Piper¹, Carlos Ribeiro¹

¹Champalimaud Centre for the Unknown, School of Biological Sciences

Jul 31, 2018

[dx.doi.org/10.17504/protocols.io.r99d926](https://doi.org/10.17504/protocols.io.r99d926)

Ribeiro Lab

Carlos Ribeiro
Champalimaud Centre for the Unknown

Abstract Protocols Metadata Metrics

ABSTRACT

This is a collection of methods and protocols from the manuscript: [Goncalves et al. Commensal bacteria and essential amino acids control food choice behavior and reproduction. Plos Biology. 2017 Apr 18.](#)

EXTERNAL LINK

<https://doi.org/10.1371/journal.pbio.2000862>

THIS PROTOCOL ACCOMPANIES THE FOLLOWING PUBLICATION



Connections... from brain cells to fish parasites

Hébert et al. *GigaScience* (2016) 5:24
DOI 10.1186/s13742-016-0128-3

GigaScience

 **Dr. Alejandro Montenegro** @aemonten · 11. Aug. 2017
Looking for someone with experience doing RNA extraction (RNA-seq quality) from primary cortical neuron cultures. Anybody?

2 9 4

 **Elena MM, PhD** @ElenaMinones
Antwort an @lteytelman @aemonten und @thatdnaguy
I'd say from those @ProtocolsIO the basic Trizol protocol should work, you need to adjust volume/cell number (protocols.io/view/RNA-extra...)

[Tweet übersetzen](#)

 **RNA extraction protocol (Trizol)**
This protocol describes how to extract total RNA from flatworms. It is from: Hébert, F, O; Grambauer, S; Barber, I; ...
protocols.io

DATA NOTE

Open Access



Transcriptome sequences spanning key developmental states as a resource for the study of the cestode *Schistocephalus solidus*, a threespine stickleback parasite

François Olivier Hébert^{1*}, Stephan Grambauer², Iain Barber², Christian R. Landry¹ and Nadia Aubin-Horth¹

Abstract

Background: *Schistocephalus solidus* is a well-established model organism for studying the complex life cycle of cestodes and the mechanisms underlying host-parasite interactions. However, very few large-scale genetic resources for this species are available. We have sequenced and *de novo*-assembled the transcriptome of *S. solidus* using tissues from whole worms at three key developmental states - non-infective plerocercoid, infective plerocercoid and adult plerocercoid - to provide a resource for studying the evolution of complex life cycles and, more specifically, how parasites modulate their interactions with their hosts during development.

Findings: The *de novo* transcriptome assembly reconstructed the coding sequence of 10,285 high-confidence unigenes from which 24,765 non-redundant transcripts were derived. 7,920 (77 %) of these unigenes were annotated with a protein name and 7,323 (71 %) were assigned at least one Gene Ontology term. Our raw transcriptome assembly (unfiltered transcripts) covers 92 % of the predicted transcriptome derived from the *S. solidus* draft genome assembly currently available on WormBase. It also provides new ecological information and orthology relationships to further annotate the current WormBase transcriptome and genome.

Conclusion: This large-scale transcriptomic dataset provides a foundation for studies on how parasitic species with complex life cycles modulate their response to changes in biotic and abiotic conditions experienced inside their various hosts, which is a fundamental objective of parasitology. Furthermore, this resource will help in the validation of the *S. solidus* gene features that have been predicted based on genomic sequence.

Keywords: Transcriptome, RNA-seq, *de novo* assembly, *Schistocephalus solidus*, Parasitology, Cestodes, Threespine stickleback, *Gasterosteus aculeatus*



Many Publishers, Journals, & Funders Encourage Full Protocol Sharing

Protocols: The Devil is in the Details

May 3, 2017 / Emma Ganley / Announcement Biology Data Debate Editorial policy News Open access PLOS Biology Policy Publications Resources Video



GigaScience encourages and assists with the submission of detailed protocols to the open access repository protocols.io. Please enter the details into protocols.io, issue a DOI, and cite the protocols.io record from the Methods section. Protocols.io now includes the ability to put in bioinformatics protocols in addition to wetlab protocols. (See <https://www.youtube.com/watch?v=BJONcAC21-A>)

<https://gatesopenresearch.org/for-authors/article-guidelines/method-articles>

Submit your Research

My Submissions

Article Guidelines

Where applicable, we also encourage authors to deposit a step-by-step description of their protocols on protocols.io, where they obtain a persistent digital object identifier (DOI), which can be included in the Methods section of the article, using [https://doi.org/10.17504/protocols.io.\[PROTOCOL DOI\]](https://doi.org/10.17504/protocols.io.[PROTOCOL DOI]) as the format (e.g. <https://doi.org/10.17504/protocols.io.hrb54w>). Authors should note that the protocol is only made public once they select "Publish" on protocols.io.



FICOO Research blog

Working with protocols.io to improve reproducibility

12 March, 2018 Lenny Teytelman

Lenny Teytelman explains how protocols.io supports reproducibility and gives us some back story

Lenny Teytelman
CEO, protocols.io

follow Lenny on

Hopefully you know already about the PLOS partnership with protocols.io; if you don't, PLOS

<https://bmjopenrespres.bmj.com/pages/policies/>

Methods

We encourage authors to deposit laboratory protocols in protocols.io, where they will be assigned their own persistent digital object identifiers (DOIs). Please cite this DOI both in your Methods section and as a reference at the end of the article.

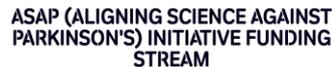
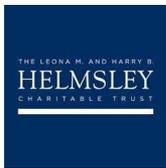
Open Science

Protocols.io: recipes for innovation in Open Science

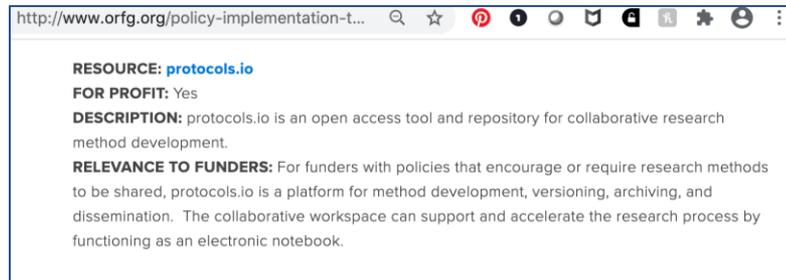
Opinion | Metadata | Researchers

Hindawi partners with Open Access platform protocols.io to make it easy for authors to publish and adapt the methods they develop and get credit for them via a dedicated citation. In this blog post, Catriona MacCallum, Hindawi's Director of Open Science, explains how it works.

- Recommended by >500 journals
- Publish method into protocols.io
- Protocol DOI in materials and methods
- Dynamic commenting, Q&A discussions, and troubleshooting
- Create new versions after publication



Many
Publishers,
Journals, &
Funders
Encourage Full
Protocol Sharing



- Grant guidelines suggest protocols.io
- Program officers encourage
- Method sharing plan requested in DMP
- Some funders require protocol sharing
- Public or Private Workspaces for groups

Importance & Value of Method Sharing

Workspaces / Coronavirus Method Development Community / Publications

Coronavirus Method Development Community

Open Community

INTERESTS
coronavirus, SARS-CoV-2, 2019-nCoV, Severe acute respiratory syndrome coronavirus 2, SARS, nCoV, COVID-19, virus, pandemic, viral, virology

Export all workspace protocols in PDF:
coronavirus-method-development-community-20201005.zip

Timeline About **Publications** 178 Members 476 Discussions 330 Resources 23 News 8

CATEGORY: All publications SORT BY: Date Search

V.4 - Direct wastewater RNA capture and purification via the "Sewage, Salt, Silica and SAR..."
Oscar Whitney¹, Basem Al-Shayeb², Alex Crits-Cristoph³, Mira Chaplin⁴, Vinson Fan¹, Hannah Greenwald⁴, Adrian Hinkle⁴, ...
¹University of California, Berkeley, Tjian & Darzacq laboratory, ²University of California, Berkeley, Banfield & Doudna...

Version 4 Nov 11, 2020
Coronavirus Method Development Community
CONTACT Oscar Whitney

COVID-19 ARTIC v3 Illumina library construction and sequencing protocol - high throughput 384 f...
DNA Pipelines R&D¹, Benjamin Farr¹, Diana Rajan¹, Emma Betteridge¹, Lesley Shirley¹, Michael Quail¹, Naomi Park¹, ...
¹Wellcome Sanger Institute

Version 2 Nov 10, 2020
Coronavirus Method Development Community
CONTACT Diana Rajan

- ✳ Increase Discoverability
- ✳ Reproducibility
- ✳ Facilitate Research Connections
- ✳ Enable Reuse
- ✳ Enhance Value of Research
- ✳ Dynamic Permanence (Versioning)
- ✳ Improved Materials & Methods
- ✳ Stewardship of Research Output
- ✳ Credit for the method developer

Accelerate & Improve Research Knowledge Dissemination

Thank you!



@GanleyEmma | emma@protocols.io