

**Genome
Science
Institute**



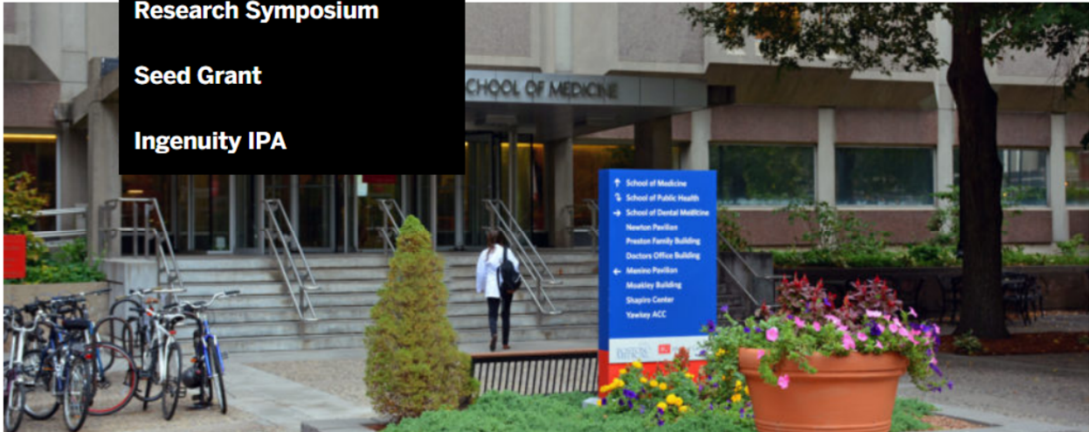
Boston University Medical Center



GSI Workshop Competition Info Session 20190220

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Established in 2008, the Boston University Genome Science Institute (GSI) seeks to expand our understanding of the role of genes in human health by fostering collaboration and serving as a resource for BU investigators engaged in genetics and genomics research and education.

The GSI spans both the Medical and the Charles River Campuses connecting a variety of investigators in departments and schools within the University. There are more than 120 [GSI faculty](#) members from the schools of Medicine, Public Health, Dental Medicine, and Arts and Sciences. The GSI unites these

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January 7, 2019

RATIONALE – A HYBRID INITIATIVE EXPERIMENT

← → ↻ ⓘ Not secure | www.bumc.bu.edu/gsi/initiatives/seed-grant-rfa/

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SEED GRANT

The 2019 Seed Grants will not be awarded this year as the allocated funds are being used in conjunction with the upcoming GSI Workshop Competition on Feb. 20th, 2019. Winners of the competition will receive 'free' reagents as funded by the GSI. For more information on the workshop competition, please click [here](#).

The Genome Science Institute is pleased to announce the availability of up to two one-year seed grants ranging up to \$25,000; each to enhance genetics and genomics research at Boston University/Boston Medical Center. These grants are intended to provide the resources needed to generate preliminary data prior to the submission of extramural grants (e.g., R01s or P01s).

PURPOSE AND SCOPE: This RFA is intended to stimulate the expansion of genetics and genomics research by enabling the generation of preliminary data and establishing collaborations so they can be convincingly presented in extramural grant applications. We encourage applicants to seek opportunities to enhance their NIH research proposal applications.

ELIGIBILITY: The RFA is open to all BU faculty on the Medical or Charles River campuses. Joint PIs are allowed. At least one PI must have been a GSI member for the six months prior to the submission deadline. (Exceptions for new faculty will be considered.) The GSI is open to all BU faculty engaged in genetics and/or genomics

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GSI Seed Grant Awards 2016

*Omission of Seed Grant Awards 2016

In 2016, the BUMC Genome Science Institute (GSI) did not accept Seed Grant applications due to opting to allocate Seed Grant funds to support RNA-sequencing training workshops for the GSI community.

No award information is available as no seed grants were awarded in 2016.

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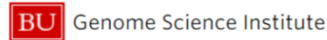
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BUSM GSI 2019 Workshop Competition Announcement

The BUSM Genome Science Institute, in collaboration with the BU Single-Cell Sequencing Center, is sponsoring two workshops this Spring 2019, providing the BUMC and BU research community a chance to explore two developing areas of genomic experiments for genomics. The workshops will accept preliminary data for future grant proposals.

Both workshops are limited competitions for labs to submit an experimental proposal by March 15, 2019. Winners selected by the GSI Review Panel would receive a set of deeply subgenomic reagents from the GSI to conduct Droplet Digital PCR (ddPCR) or a pilot Single-Cell RNA Sequencing experiment (scRNASeq). Three awards for ddPCR (up to \$2400 reagent value per lab) and three awards for scRNA-Seq (up to \$9000 in reagent value per lab) will be made for the best-chosen proposals.

On February 20, the GSI will host a seminar by Biorad scientists on the theory and workflow of Droplet Digital PCR on the QX200 instrument housed on K-building, 2nd floor. There will be an info session discussing the scope of the Single Cell RNA Sequencing Pilot experiment. These workshop awards will allow labs to conduct significant but focused pilot experiments. Details will be discussed at the February seminar and updated on this website.

[If your lab is interested in ddPCR, please enter your interest information at this link.](#)

Two-page long proposals must be submitted to the GSI website by March 15, and winners will be announced promptly and will be required to submit samples for experimentation by the end of the Spring term. Results from pilot experiments should then be presented at the GSI Research Symposium in November, 2019.

TIMELINE

**EMAIL YOUR 2-PAGE APPLICATION TO
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**Awards will be announced in
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Sequencing or Droplet Digital PCR
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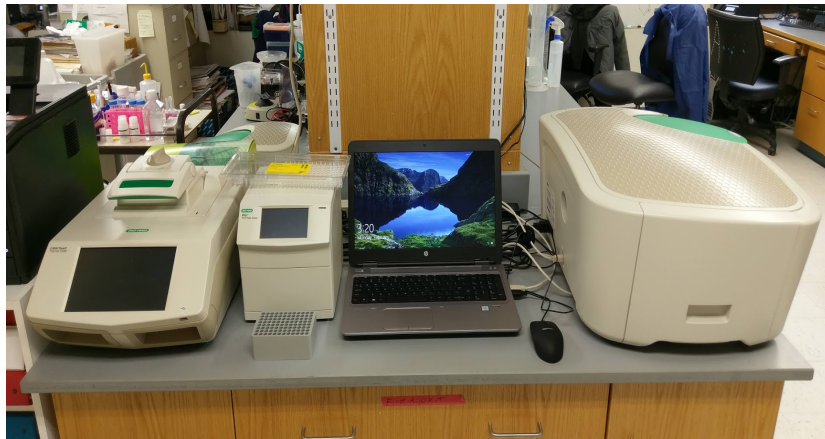
**Present data findings at the GSI
Annual Research Symposium in
November, 2019**

Why do we have a new Biorad QX200 ddPCR system?



Fred Gage lab publishes in Science March 2018 that L1 Transposon Copy Number Expansion in mouse brain can be measured by ddPCR (Biorad QX200 system).

The Lau lab received an Admin Supplement in September 2018 to study Transposon Copy Number expansion in Alzheimer's Disease. Lau lab purchases the QX200 system located in K-building 206.



Lau joins the GSI as a Co-director in October, 2018. GSI provides funds for Workshop reagents to encourage BUMC labs to try it out.

Etiquette for using the Biorad QX200

Contact GSI@BU.EDU for access to an Online Sign Up sheet to schedule your run (Google-Sheets Calendar).



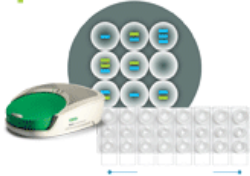
Get trained on machine with Biorad specialists next. (i.e. with Tara & Aron via the Workshop)

Check in again with Lau lab members to go over practical procedure for doing a run.

Sign up ahead of time online. complete your runs in one day.

Do your data analysis in your lab, not on instrument machine.

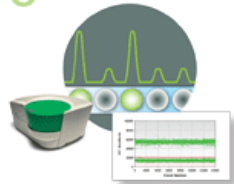
1 Generate droplets



2 Perform PCR with EvaGreen or hydrolysis probes



3 Read and analyze results



Special Considerations for Single-Cell RNA-Seq PART1



**Find a good rationale (can be exploratory)
for learning something NEW about your system
with Single-Cell RNA Seq.**

**Generate Prelim DATA
for your Next R01 Grant Application.**

**This is a PILOT SC-RNASeq Experiment,
limited to ~4 samples ideally,
not too much room for more samples.**

**Pilot will capture 2000 cells per sample and
includes the library preparation and one
sequencing run providing ~50,000 reads per cell.**

**The reagents are kindly
provided by 10x Genomics
and Illumina**

**Capturing more cells (up to 10K cells) is possible
but incurs additional investigator's expense.**

Special Considerations for Single-Cell RNA-Seq PART2



Make sure your cell sample is readily sortable as a single-cell suspension. Tissue cultures or primary cells normally in suspension are ideal.

For tissue that needs dissociation, make sure this process is already optimized. Cells should be at 700 -1200 cells/ul and **over 90% viable**. The cells can not be fixed or frozen!

The majority of the costs will be subsidized, but the Awarded Labs will be responsible for a “buy-in” fee of \$1000 to cover initial expenses not covered by the GSI.

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We encourage all investigators to meet with the BU Single Cell Sequencing Core to discuss the technical details of the experiment!

BUMC Single Cell Sequencing Core (SCSC) and Microarray and Sequence Resource (MaSR)

<http://www.bumc.bu.edu/singlecell/>



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Pricing

Single Cell Library

Application	Input Cell Concentration	Captured Cells	Library Preparation
 Chromium 10x Genomics	100-2,000 cells/uL	500- >10,000 cells	\$1,650 per sample (4 samples min)
 ddSEQ Single Cell Isolator	2,500 cells/uL	300-500 cells	\$475 per sample (4 samples min)
 CEL-seq	---	< 96 cells	\$550 per plate
Coming Soon			

Consultation



Ready to submit
[Request a cons](#)

<http://www.bumc.bu.edu/microarray/>

Boston University Medical Campus Microarray and Sequencing Resource

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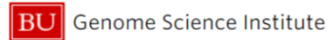
Sequencing Library Preparation

APPLICATION	INTERNAL PRICING	EXTERNAL ACADEMIC PRICING
<i>mRNA (poly-A selection)</i>		
— Illumina TruSeq Stranded mRNA	\$250.00	\$280.00
— NEBNext Ultra II RNA	\$225.00	\$255.00
<i>Whole Transcriptome (rRNA reduction)</i>		
— Illumina TruSeq Stranded Total RNA	\$300.00	\$330.00
— Kapa RNA HyperPrep with RiboErase	\$290.00	\$320.00
<i>Small RNA</i>		
— Illumina TruSeq Small RNA	\$320.00	\$350.00
— NEBNext Small RNA	\$270.00	\$300.00
<i>Small Genome</i>		
— Illumina Nextera XT	\$135.00	\$155.00

** All library preparation prices listen refer to the cost per sample

Illumina NextSeq 500 Next Generation Sequencing

APPLICATION	INTERNAL PRICING	EXTERNAL ACADEMIC PRICING
<i>Midi Output – 130M Single Reads or 260M Paired End Reads</i>		
150 Cycles	\$1450.00	\$1550.00
300 Cycles	\$2150.00	\$2250.00
<i>High Output – 400M Single Reads or 800M Paired End Reads</i>		
75 Cycles	\$1800.00	\$1900.00



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Proposal Judging Criteria

**Who will be judging proposals:
A Committee assigned by the GSI**

What we will be looking for in proposals:

**Indicate choice of Digital PCR or Single-Cell-Seq,
and why you are not already doing these techniques on a regular basis.**

Adhere to the 2-page maximum (including figures).

Good definition of the scientific question.

Does not have to be hypothesis-driven, can be exploratory.

Good sample system for obtaining single cells or clean nucleic acid.

Collaboration with another lab a Plus!

Proper definition of pilot project scope (don't overshoot).

Preference will be given to first time users of the technology.

CONSIDER YOUR PILOT EXPERIMENT'S SCOPE:

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**THREE AWARDS for ddPCR:
Up to \$2400 in reagents/lab**

**Allows for >200 assays,
No Lab Buy-In required.
(choose Evagreen vs Probe)**

**THREE AWARDS for Single-Cell RNA Seq:
Up to \$10.3K in subsidies
BUT need \$1000 cost for Lab buy in
(Full cost without subsidy is >\$11K)**

**Enough to profile ~4 samples
(i.e. 2 Experiment and 2 Control)
~50K reads/sample of ~2000 cells**



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**Any other
questions?**

**Email
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The GSI greatly appreciates the generosity of Biorad Inc for the support on the ddPCR workshop, and 10X Genomics and Illumina for the Single-Cell RNA Seq workshop.

