DATASHEET

Financing a cryo-EM laboratory

A vital step in the cryo-EM workflow

Establishing a cryo-electron microscopy (cryo-EM) laboratory requires substantial resources for equipment and infrastructure. Also, operating expenses have to be planned. There are several aspects to consider when financing a cryo-EM laboratory:

- Several possible grant schemes are available in Europe, US and Asia that allow for the purchase of a dedicated cryo-electron microscope. These public funding options are based on existing programs and, in general, open for academic researchers to apply for. Thermo Fisher Scientific can assist in getting a project started for these types of grant applications.
- In cases where there is a benefit in spreading the purchase cost over an extended period, Thermo Fisher Financial Services provides unique financing options that can be tailored to the individual customer's needs and situation.

Importantly, investing in cryo-EM provides tremendous benefits not only to the research group, but to the institution as a whole. The availability of a state-of-the-art cryo-electron microscope, that is dedicated to structural biology research, has proven to be a strongly attractive for the most talented scientists. Such an instrument empowers researchers to realize impactful research and publish in renowned journals.

Examples of existing grant schemes for the purchase of cryo-EM equipment		
United States		
NIH High-End Instrumentation (HEI) Grant Program	The High-End Instrumentation (HEI) Grant Program encourages applications from groups of NIH-supported investigators to purchase or upgrade a single item of expensive, specialized, commercially available instrumentation or an integrated system that costs up to $2,000,000.	More information at https://orip.nih.gov/construction-and-instruments/s10-instrumentation-programs and https://grants.nih.gov/grants/guide/pa-files/PAR-18-598.html
Europe		
European Research Council (ERC) Grant	Principal Investigators from anywhere in the world who wish to carry out a project with a host institution in a EU member state or in one of the Associated Countries can apply for an ERC grant. The ERC awards funding to established research leaders and also to excellent investigators looking to set up or consolidate their own independent research team or program.	More information at https://erc.europa.eu/
Japan		
Japan Agency for Medical Research and Developmen (AMED) Grant	The Japanese funding agency was founded as a conglomerate from the Ministries of Education, Health and Economics. AMED promotes integrated research and development in the field of medicine, from basic research to clinical trials.	More information at https://www.amed.go.jp/en/index.html
AMED Exploratory Research for Advanced Technology (ERATO) Research Funding Program	The goal of ERATO is to promote problem-solving-oriented basic research, guided by strategies set by the government based on social and economic needs as well as Japan's national policy on science and technology.	More information at https://www.jst.go.jp/erato/en/

Besides these examples, other grant schemes may be applicable on the national, regional and university levels. For specific information, please discuss your needs with a Thermo Fisher Scientific representative. Public funding options are generally open for applications from most academic researchers. We are happy to provide you with assistance you may need in order to start the grant application process.

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Equipment leasing and financing options offered by Thermo Fisher Financial Services

In many cases, financing the equipment is a challenge. The Thermo Fisher Financial Services team understands the unique requirements of university, government (federal, state/ provincial and municipal), industry and research lab procurement procedures.

For off–balance sheet financing, accelerated return on investment (ROI), technology protection or cash flow management, innovative financing options can help meet budgetary needs and bottom-line goals.

Early in the process, the Thermo Fisher Financial Services team will discuss the possible lease programs that allow an economical acquisition of equipment, while meeting the requirements set by management. The main benefits of the program include:

- Competitive, flexible terms
- Reduced capital outlay, optimized cash flow
- One stop shop that includes service, buildouts, and more
- Quick approval process & simple documentation
- Upgrade program to access the newest technology
  - Upgrade to new technology after 3 to 5 years
  - Lower the acquisition cost
  - Utilize operating funds vs. capital expenditures
  - Reduce capital outlay and depreciation concerns
  - Reduce the risk of obsolescence
  - Includes extended service

In some cases, Thermo Fisher Financial Services may also be able to advise on tax benefit and other programs.

Operating expenses for a cryo-EM laboratory

When planning a cryo-EM laboratory, it is important to include provision for the operating expenses. This cost can be grouped in three categories:

1. Personnel: It is advisable to have one full time employee to be responsible for the microscope however it is purely a choice of your institution/group since other arrangements are possible.
2. Service contract: To plan for the highest equipment availability, it is highly advisable to cover the equipment by a service contract, which includes preventive as well as corrective maintenance. Contracts with application support are also possible. The broad service offerings portfolio for cryo-EM ensures the availability of a suitable support plan meeting different needs and budget requirements. For an overview of the service contract options and a budget estimation please contact your local sales representative.
3. Other running costs: This consists of consumables, power consumption and HDD to carry the data. The price ranges roughly from $60,000 to $75,000.

Recognition and benefits of cryo-EM to the institution

Researchers using cryo-EM are producing outstanding breakthrough results, thanks to recent technological advances. The success of cryo-EM has resulted in:

- Increasing numbers of structures resolved by cryo-EM primarily based on Thermo Scientific™ instruments (**Figure 1**)
- An increase in publications in high impact factor scientific journals, with structures resolved using Thermo Scientific™ Krios™ Cryo-TEM (**Figure 2**)

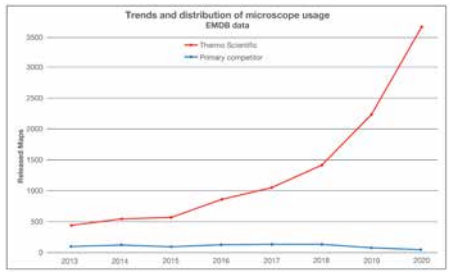

Figure 1. Electron Microscopy Data Bank (EMDB) of r eleased cryo-EM structures resolved by Thermo Scientific electron microscopes and primary competitor between 2013 – 2020. The number of released structures is primarily growing due to Thermo Scientific instrument contributions, whereas primary competitor stays flat over the years.

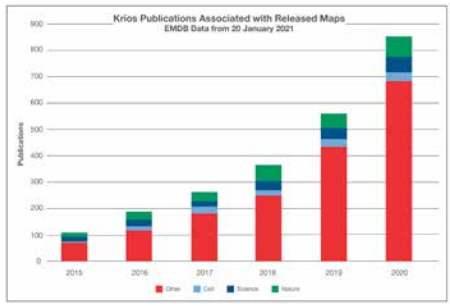

Figure 2. EMDB Publication trends between 2015 – 2020, showing an increase of publications in Nature, Science, Cell and other magazines. All publications used data from the Krios Cryo-TEM

It has been recognized that cryo-EM brings significant benefits to the research groups and also increases institutional standing for facilities with cryo-EM facilities:

- Increased scientific publications and discoveries
- Attractive location for recruiting researchers and grants
- Increase amount of international students – tuition

The technological success of cryo-EM also enables rapid progress in the search for more precise and powerful therapies for a wide array of human diseases, which triggered interest from the pharmaceutical industry:

- Collaboration on resolution of pharmaceutically targeted structures via cryo-EM, X-ray diffraction, and nucleic magnetic resonance
- Financial support of research projects

Find out more at **thermofisher.com/em-sample-prep**

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