GROUPE FRANÇAIS DE BIOENERGÉTIQUE

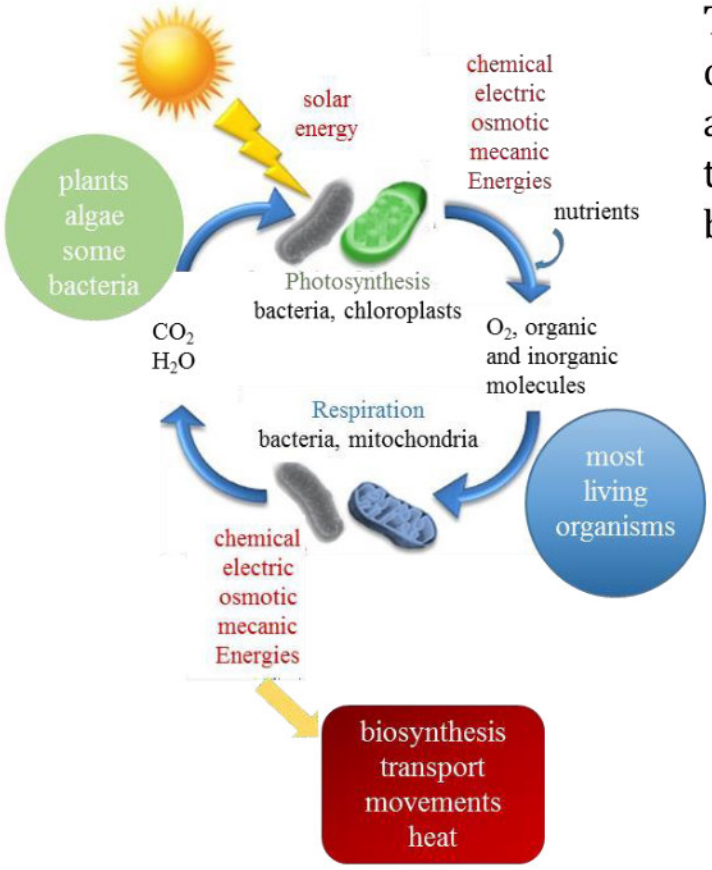
Presentation

What is GFB ?

→ The **G**roupe **F**rançais de **B**ioénergétique (**GFB**) is a non-profit association under the 1901 law whose objective is to develop scientific research in **Bioenergetics** and to bring together all the laboratories working in this field.

What is Bioenergetics ?

→ Bioenergetics studies the **mechanisms of energy conversion by living organisms** whether bacteria, unicellular eukaryotes, fungi, plants, animals and humans. This energy can be light, electrical, chemical, osmotic, mechanical or thermal.



The conceptual foundations of Bioenergetics were built around the chemiosmotic theory, formulated in 1961 by Peter Mitchell.

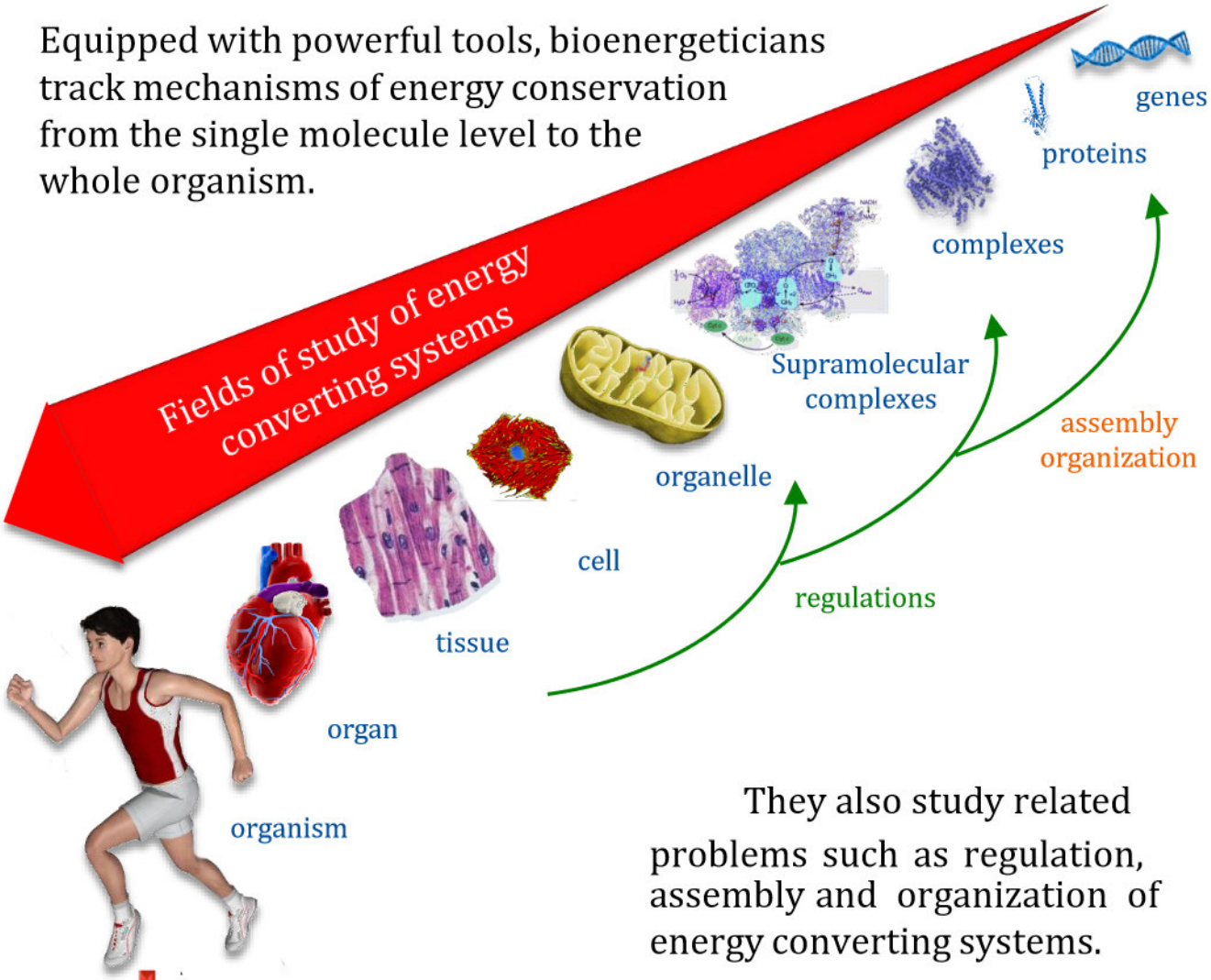
Peter Mitchell
Nobel prize in Chemistry
in 1978.

Disciplines and techniques of Bioenergetics

Bioenergetics lies at the frontiers of biology, physics and chemistry.

It involves various techniques and disciplines as varied and complementary as genetics, molecular biology, genomics, protein biochemistry, crystallography, modelling, cell cultures, high resolution microscopy, fluorimetry, high resolution spectroscopy, analytical biochemistry, proteomics, metabolomics, high resolution spectrometry, high resolution oxygraphy, etc.

Equipped with powerful tools, bioenergeticians track mechanisms of energy conservation from the single molecule level to the whole organism.



They also study related problems such as regulation, assembly and organization of energy converting systems.

What is the purpose of Bioenergetics ?

Bioenergetics is a fundamental discipline whose primary ambition is to increase knowledge about the mechanisms of energy conversion by living organisms. The societal issues of this knowledge are enormous, particularly in the fields of:

→ Health and well-being :

Bioenergetics makes a major contribution to the study of **pathologies related to mitochondrial dysfunction** and to the study of **drug resistance in cancer**. Bioenergetics participates in the study of processes or phenomena such as **cell death and oxidative stress** at the heart of the mechanisms of **development, aging and degeneration**. Bioenergetics also brings a new perspective to the study of **pathologies related to an imbalance of the microbiota** in the digestive or respiratory tracts.

→ Industrial applications :

The decoding of the functioning of proteins involved in bioenergetics has many applications in industry such as the **manufacture of biocells and biocatalysts**.

→ New energies :

A detailed understanding of the mechanisms of **photosynthesis** and of **energy conversion carried out by microorganisms** is essential for the development and evaluation of **new environmentally friendly energy production methods**.

Who are GFB members ?

GFB is open to researchers, professors, engineers, post-doctoral researchers and PhD students from all research organizations (CNRS, INSERM, CEA, INRA, Universities, Hospitals…) as well as private sector research actors in the field of Bioenergetics.

What are GFB activities ?

→ Organization of a biennial national congress

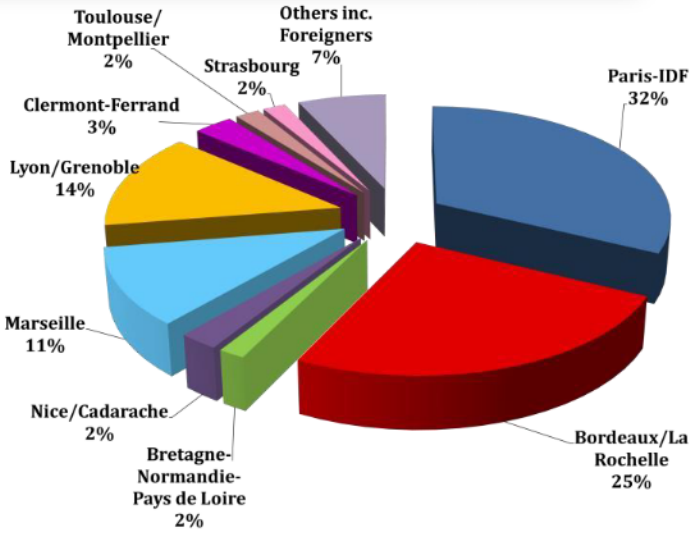
To maintain a dynamic of collaboration between the different laboratories, for more than 40 years, the main activity of **GFB** is the organization of a biennial congress. With some 100 participants, this congress offers an irreplaceable framework for taking stock of research in Bioenergetics at the national level and for in-depth discussions covering the entire discipline.

→ Promoting young researchers

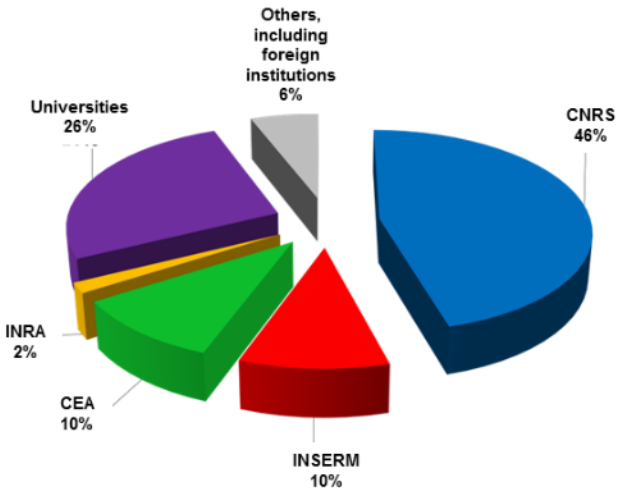
Young researchers represent 40% of the congress participants. 50% of oral presentations are given by PhD students who thus have the opportunity to present their work in front of their peers for the first time. This represents the first stage to later participate at International conferences such as, for instance, the EBEC (European Bioenergetics Conference) or prestigious conferences like the Gordon Conferences "Bioenergetics" or "Mitochondria and Chloroplasts".

Who attends GFB congresses?

→ The distribution of bioenergeticians is quite uneven across the country, but all regions where this discipline is represented send participants to **GFB** congresses.



Geographical origin of participants to GFB conferences (1999-2019)



Affiliation of participants to GFB conferences (1999-2019)

→ Scientists from all major biological research organizations as well as universities and colleges attend **GFB** congresses.

→ **A national congress, open to international participants**

GFB conferences obviously welcome foreign researchers of all nationalities. Most of them are PhD students or post-doctoral Fellows working in France, but some come from foreign laboratories, particularly European ones. Since 2011, several internationally renowned foreign researchers have been invited to plenary conferences.

GFB is also...

→ A source of fellowships for students

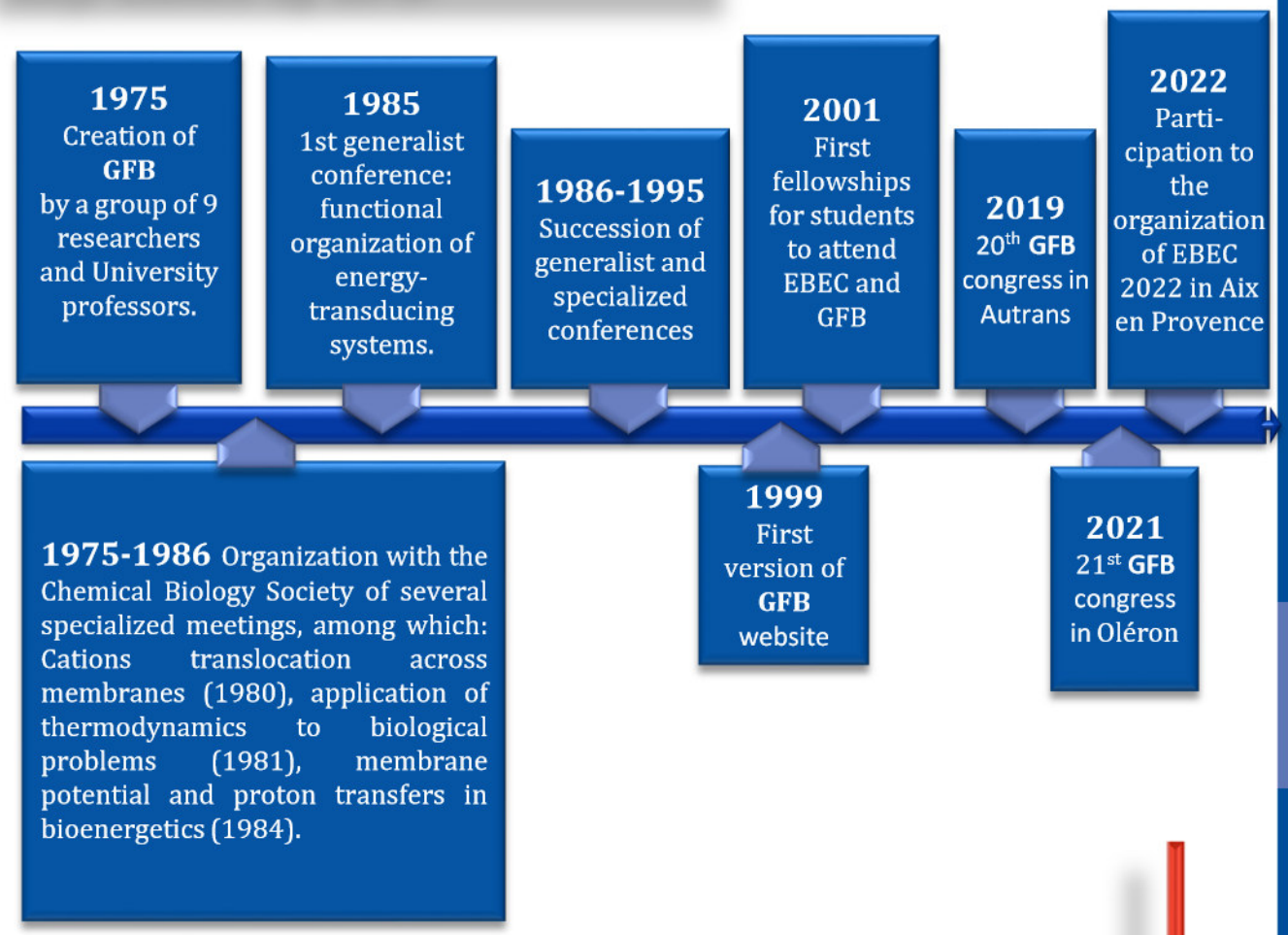
Every two years, a dozen of fellowships covering the registration and lodging fees are granted to PhD students to attend the GFB conference. On the basis of the presentation of their results at the GFB conference, students can earn fellowships to attend the European Bioenergetic Conference.

→ A network to share information

GFB creates a network to share scientific, technical, and practical information. New scientific collaborations are initiated at each conference. PhD or post-doc positions are regularly announced on the **GFB** website and through the mailing list.

→ GFB is represented in the international organizing committee of EBEC (European Bioenergetics Conference)

Key dates of GFB

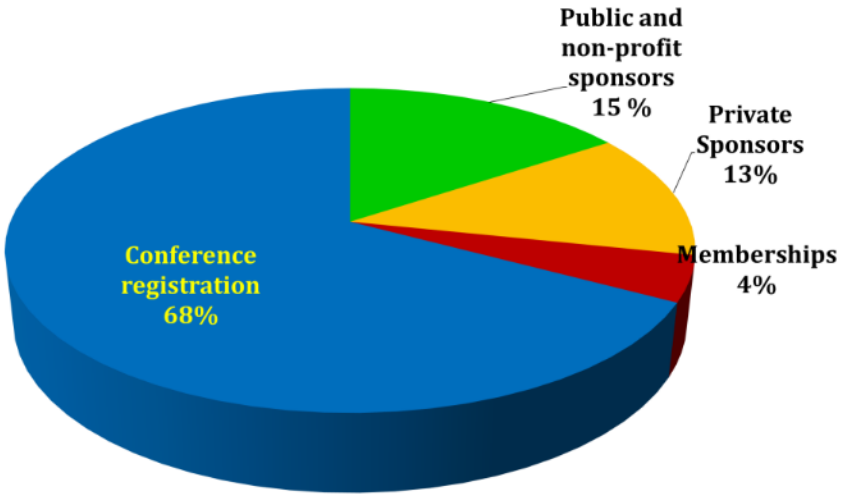


GFB 's financing :

→ **GFB** is primarly financed through the payment of memberships and conference registrations.

→ **GFB** receives financial support of private and public sponsors for the organization of its biennial conference.

→ Private companies support financially **GFB** conferences. In return, GFB allows oral presentation of sponsors, distribution of advertizing material and/or venue at commercial booth during the conference.



Private, public and associative sponsors are indispensable to maintain affordable conference registration fees, to invite reknown international speakers and to offer fellowships to PhD students for participation to GFB and EBEC conferences.

Honorific members of GFB :

Professeur Pierre Joliot, professeur honoraire au Collège de France, médaille d'or du CNRS, membre de l'Académie des Sciences, Membre de la National Academy of Sciences (Etats-Unis), Grand Officier de la Légion d'Honneur, Commandeur de l'Ordre National du Mérite, membre fondateur du **GFB** :

«Accessibles à l'observation par de multiples approches spectroscopiques, les processus bioénergétiques ont suscité l'intérêt d'une communauté très variée et ceci bien avant que les complexes protéiques, sièges de la transduction d'énergie, ne soient accessibles aux études biochimiques, moléculaires ou encore structurales. Aujourd'hui, la plupart des composants essentiels des chaînes de transfert d'électron respiratoire ou photosynthétique sont connus à l'échelle atomique et la description des chemins réactionnels qu'ils empruntent a atteint un niveau de précision mécanistique peu commun en biologie. Cette connaissance approfondie permet à la communauté des bioénergéticiens d'étendre son champ d'investigation pour s'intéresser aux régulations physiologiques des processus métaboliques ainsi qu'à la diversité des stratégies mises en œuvre pour décliner les grands principes de la bioénergétique en d'innombrables variations et les adapter ainsi à la diversité environnementale ».

Professeur Eva Pebay-Peyroula, Institut de Biologie Structurale de Grenoble, médaille d'argent du CNRS, membre de l'Académie des Sciences, Officier de la légion d'honneur :

« Appréhender les mécanismes de transport mitochondriaux à l'échelle moléculaire apporte une vision unique des protéines impliquées dans l'échange ADP/ATP lié à la production de l'ATP. Les analyses des relations entre structure, fonction et dynamique couplant cristallographie, dynamique moléculaire et études fonctionnelles sur les transporteurs isolés sont essentielles, mais n'apportent qu'une réponse partielle. Les congrès rassemblant la communauté du GFB sont des moments privilégiés d'échanges entre chercheurs couvrant plusieurs disciplines permettant ainsi la confrontation entre informations moléculaires et données à l'échelle cellulaire ou de l'organisme entier. Une telle intégration est indispensable à la compréhension des processus bioénergétiques cellulaires ».

Professeur Daniel Ricquier, médaille d'argent du CNRS, Prix Paul Langevin de l'Académie des sciences, médaille Wertheimer de l'International Association of Study on Obesity, membre de l'Académie des Sciences :

« La bioénergétique correspond à une dimension essentielle de la biologie : aucun mécanisme, aucune interaction ou voie métabolique ou processus biologique n'échappe aux contraintes ou ordres imposés par l'énergétique. Comparée à la lecture de cartes métaboliques ou la lecture de successions de réactions, la dimension bioénergétique donne ordre, vitesse et taille aux événements biologiques au sein d'un système. La bioénergétique est aussi un véritable langage entre biologistes, que l'on traite de cellules de méristème, de levures, neurones ou micro-organismes, nous nous comprenons tous et ainsi, grâce au GFB, nous améliorons considérablement notre compréhension du vivant et sommes meilleurs chercheurs et meilleurs enseignants ».

Scientific and organizing committee of the 21st GFB conference

Laura Baciou	*CNRS Research Director, Laboratoire de Chimie Physique, UMR 8000, CNRS-Université Paris-Sud, Paris-Saclay.*
Lucie Bergdoll	*CNRS researcher, Laboratoire de Dynamique et d'assemblage des Protéines Trans-membranaires,UMR7281/IMM – CNRS,Marseille.*
Laurent Counillon	*Professor, Laboratoire de PhysioMédecine Moléculaire, UMR 7370, Faculté de Médecine de Nice.*
Mickaël Cohen	*CNRS Research Director, Institut de Biologie Physico-Chimique, UMR8226, Paris.*
Pierre Cardol *Vice-President*	*Associate Professor FNRS, Laboratoire de Génétique et Physiologie des Microalgues, Université de Liège, Belgique.*
Anne Devin *secretary*	*CNRS Research Director, Institut de Biochimie et Génétique Cellulaire, UMR 5095, Bordeaux .*
Giovanni Finazzi	*CNRS Research Director, Laboratoire de physiologie végétale et cellulaire, UMR 5168 CNRS/CEA/UJF, Grenoble.*
Marie-France Giraud *Assistant secretary*	*CNRS researcher, Institut de Biochimie et Génétique Cellulaires, UMR 5095 Bordeaux.*
Marianne Guiral *accountant*	*CNRS researcher, Laboratoire de Bioénergétique et Ingénierie des Protéines, UMR7281/IMM – CNRS, Marseille.*
Petra Hellwig	*Professor, Laboratoire de bioélectrochimie et spectroscopie UMR7140 CNRS - Université de Strasbourg.*
Axel Magalon	*CNRS Research Director, Laboratoire de Chimie Bactérienne, UMR 7283/IMM-CNRS, Marseille.*
Fabien Pierrel	*CNRS research director, Laboratoire IMC-IMAG,UMR5525, Grenoble .*
Ludovic Pelosi	*Associate Professor Laboratoire TIMC-IMAG, UMR5525, Grenoble.*
Eric Pilet *President*	*Associate Professor, Laboratoire de Bioénergétique et Ingénierie des Protéines, UMR7281/IMM-CNRS, Marseille.*
Barbara Schoepp-Cothenet	*CNRS research Director, Laboratoire de Bioénergétique et Ingénierie des Protéines, UMR7281/IMM-CNRS, Marseille*

Sessions

Evolution and electron bifurcation importance
Structures in bioenergetics, Transporters and Membranes
Photosynthetic Organisms
Mitochondria
Microbial metabolism and consortium

Date et location of the 2snt congress

Septembre 28th October 1st 2023
Village Vacances "*Les Florans*"
Chemin des Florans
84410 Bédoin

To contact GFB

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