

heavy metal. These changes can be observed in patients in real time with a specialized MRI approach called hyperpolarization. By transiently changing the nuclear spin of naturally occurring intermediates in cellular energy production, the metabolic fate can be observed with greater than 10,000-fold sensitivity. Current methods of hyperpolarization require expensive machines with limited throughput.

Potential Commercial Applications:

- MRI imaging
- Hyperpolarization
- Infusion Device for imaging reagents
- Cancer diagnostics
- Cardiovascular disease diagnostics

Development Stage:

- Early stage

Inventors: Rolf E. Swenson (NHLBI), Jessica H. Etteedgui-Benjamini (NHLBI), Carolyn Woodroffe Hitko (NCI), Murali K. Cherukuri (NCI), and Natarajan Raju (NHLBI).

Intellectual Properties:

- HHS Reference No. E-035-2022-0 "Preparation Of Isotopically Labeled Ketoglutarates And Methods Of Hyperpolarization Through Signal Amplification By Reversible Exchange (SABRE)"; U.S. Provisional Patent Application No. 63/303,190 filed January 26, 2022; Patent Cooperation Treaty Application PCT/US2023/011640 filed January 26, 2023.

- HHS Reference No. E-036-2022 "Sabre Catalysts Containing Fluorinated Carbon Chains For Delivery Of Metal-Free MRI Contrast Agents"; U.S. Provisional Patent Application 63/328,545 filed April 7, 2022; Patent Cooperation Treaty Application PCT/US2023/017885 filed April 7, 2023, U.S. Patent Application 18/410,773 filed January 11, 2024, Applications also pending in Japan, Canada, Israel, China, and Europe.

- HHS Reference No. E-052-2022 "Infusion device for the preparation and delivery of MRI probes," U.S. Provisional Patent Application 63/328,556 filed April 7, 2022, Patent Cooperation Treaty Application PCT/US2023/017895 filed April 7, 2023.

- HHS Reference No. E-069-2020 "Real-time Monitoring Of In Vivo Free Radical Scavengers Through Hyperpolarized [1-¹³C] N-acetyl Cysteine," U.S. Provisional Patent Application 62/961,855 filed January 16, 2020, Patent Cooperation Treaty Application PCT/US2021/013634 filed January 15, 2021, European Patent Application 21741034.9 filed January 15, 2021, Israeli Patent Application 294365 filed January 15, 2021, European Patent Application 17/793,083 filed January 15, 2021.

- HHS Reference No. E-070-2020 "Isotopes Of Alpha Ketoglutarate And Related Compounds For Hyperpolarized MRI Imaging," U.S. Provisional Patent Application 62/962,473 filed January 17, 2020, Patent Cooperation Treaty Application PCT/US2021/013658 filed January 15, 2021, European Patent Application 21741941.5 filed January 15, 2021, Israeli Patent Application 294464 filed January 15, 2021, U.S. Patent Application 17/793,089 filed January 15, 2021.

- HHS Reference No. E-039-2022 "Temperature Cycling Method for Hyperpolarization of Target Molecules and Contrast Agents using Parahydrogen," US Provisional Patent Application 63/203591 filed July 27, 2021, Patent Cooperation Treaty Application PCT/US2022/074122 filed July 26, 2022, U.S. Application 18/291,681.

Publications:

- Perfluorinated Iridium catalyst for signal amplification by reversible exchange provides metal-free aqueous hyperpolarized [1-¹³C]-Pyruvate. J. Etteedgui, B. Blackman, N. Raju, S. Kotler, E. Chekmenev, B. Goodson, H. Merkle, C. Woodroffe, C. LeClair, K. Murali, R. Swenson. *J. Am. Chem. Soc.* 2024, 146, 946–953.

- Monitoring response to a clinically relevant IDH inhibitor in glioma—Hyperpolarized ¹³C magnetic resonance spectroscopy approaches. D. Hong, Y. Kim, C. Mushti, N. Minami, J. Wu, M. K. Cherukuri, R. E. Swenson, D. B. Vigneron, S. M. Ronen. *Neuro-Oncology Advances* 2023, DOI: <https://academic.oup.com/nao/article/5/1/vdad143/7337326>.

- Catalyst-Free Aqueous Hyperpolarized ¹³C-Pyruvate Obtained by Re-Dissolution Signal Amplification by Reversible Exchange A. B. Schmidt; H. de Maissin; I. Adelabu; S. Nantogma; J. Etteedgui; P. TomHon; B. M Goodson.; T. Theis; E. Y. Chekmenev. *ACS Sensors* 2022, 7 (11), 3430–3439.

- Rapid ¹³C Hyperpolarization of the TCA-Cycle Intermediate α -Ketoglutarate via SABRE-SHEATH. I. Adelabu, Isaiah; Etteedgui, Jessica; Joshi, Sameer; Nantogma, Shiraz; Chowdhury, Md Raduanul; McBride, Stephen; Theis, Thomas; Sabbasani, Venkata; Chandrasekhar, Mushti; Sail, Deepak; Yamamoto, Kazutoshi; Swenson, Rolf; Krishna, Murali; Goodson, Boyd; Chekmenev, Eduard. *Anal. Chem.* 2022, 94, 13422–13431.

- Order-Unity ¹³C Nuclear Polarization of [1-¹³C]Pyruvate in Seconds and the Interplay of Water and SABRE Enhancement. I. Adelabu, P. TomHon, M. S. H. Kabir, S Nantogma, M. Abdulmojeed, I. Mandzhieva, J.

Etteedgui, R. E. Swenson, M. C. Krishna, T. Theis, B. M. Goodson, and E. Y. Chekmenev. *ChemPhysChem.* 2022, 23, 131–136.

- Simple esterification of [1-¹³C]-alpha-ketoglutarate enhances membrane permeability and allows for non-invasive tracing of glutamate and glutamine production. J. AbuSalim, K. Yamamoto, N. Miura, B. Blackman, J. Brender, C. Mushti, T. Seki, K. Camphausen, R. Swenson, M. Krishna, A. Kesarwala. *ACS Chem. Biol.* 2021, 16, 2144–2150. DOI: 10.1021/acschembio.1c00561

- Synthesis of [1-¹³C-5-12 C]-alpha-ketoglutarate enables non-invasive detection of 2-hydroxyglutamate. N. Miura, C. Mushti, D. Sail, J. E. Bingham, K. Yamamoto, J. R. Brender, T. Seki, D. I. AbuSalim, S. Matsumoto, K. A. Camphausen, M. C. Krishna, R. E. Swenson, A. H. Kesarwala. *NMR in Biomedicine* 2021, 34, e4588. <https://doi.org/10.1002/nbm.4588>.

- Low-cost High-Pressure Clinical-Scale 50% Parahydrogen Generator Using Liquid Nitrogen at 77 K. B. Chapman, B. Joalland, C. Meersman, J. Etteedgui, R. E. Swenson, M. C. Krishna, P. Nikolaou, K. V. Kovtunov, O. G. Salnikov, I. V. Koptuyug, M. E. Gemeinhardt, B. M. Goodson, R. V. Shchepin, and E. Y. Chekmenev. *Anal. Chem.* 2021, 93, 8476–8483.

- Real Time Insight into In Vivo Redox Status utilizing Hyperpolarized [1-¹³C] N-Acetyl Cysteine. K. Yamamoto, A. Opina, D. Sail, B. Blackman, K. Saeito, J. R. Brender, R. M. Malinowski, T. Seki, N. Oshima, D. R. Crooks, S. Kishimoto, Y. Saida, Y. Otowa, P. L. Choyke, J. H. Ardenkjaer-Larsen, J. B. Mitchell, W. M. Linehan, R. E. Swenson, M. C. Krishna. *Sci. Reports* 2021, 11, 12155.

Dated: May 23, 2024.

Michael A. Shmilovich,

Senior Licensing and Patenting Manager, National Heart, Lung, and Blood Institute, Office of Technology Transfer and Development.

[FR Doc. 2024-11796 Filed 5-29-24; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Center for Scientific Review; Notice of Closed Meetings

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of the following meetings.

The meetings will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), Title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: Aging and Neurodegeneration Integrated Review Group; Cellular and Molecular Biology of Neurodegeneration Study Section.

Date: June 24–25, 2024.

Time: 8:30 a.m. to 8:30 p.m.

Agenda: To review and evaluate grant applications.

Place: The Darcy, 1515 Rhode Island Ave. NW, Washington, DC 20005.

Meeting Format: In Person.

Contact Person: Laurent Taupenot, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 4188, MSC 7850, Bethesda, MD 20892, 301-435-1203, laurent.taupenot@nih.gov.

Name of Committee: Infectious Diseases and Immunology B Integrated Review Group; Bacterial-Host Interactions Study Section.

Date: June 25–26, 2024.

Time: 9:00 a.m. to 8:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Uma Basavanna, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Bethesda, MD 20892, (301) 827-1398, uma.basavanna@nih.gov.

Name of Committee: Molecular, Cellular and Developmental Neuroscience Integrated Review Group; Neurodifferentiation, Plasticity, Regeneration and Rhythmicity Study Section.

Date: June 25–26, 2024.

Time: 9:00 a.m. to 8:30 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Jacek Topczewski, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 1002A1, Bethesda, MD 20892, (301) 594-7574, topczewskij2@csr.nih.gov.

Name of Committee: Center for Scientific Review Special Emphasis Panel; Small Business: Biobehavioral Processes.

Date: June 25–26, 2024.

Time: 9:00 a.m. to 8:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Jeanne M. McCaffery, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Bethesda, MD 20892, (301) 594-3854, jeanne.mccaffery@nih.gov.

Name of Committee: Healthcare Delivery and Methodologies Integrated Review Group; Science of Implementation in Health and Healthcare Study Section.

Date: June 25–26, 2024.

Time: 9:00 a.m. to 6:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Wenjuan Wang, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 3154, Bethesda, MD 20892, (301) 480-8667, wangw22@mail.nih.gov.

Name of Committee: Center for Scientific Review Special Emphasis Panel; Topics in Health Services Research: Health Information Technology and Clinical Informatics.

Date: June 25–26, 2024.

Time: 9:00 a.m. to 6:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Debasmita Patra, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 1006E, Bethesda, MD 20892, (301) 827-5187, debasmita.patra@nih.gov.

Name of Committee: Center for Scientific Review Special Emphasis Panel; Advancing Therapeutics.

Date: June 25–26, 2024.

Time: 9:30 a.m. to 6:30 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Lystranne Alysia Maynard Smith, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Bethesda, MD 20892, 301-402-4809, lystranne.maynard-smith@nih.gov.

Name of Committee: Population Sciences and Epidemiology Integrated Review Group; Population based Research in Infectious Disease Study Section.

Date: June 25–26, 2024.

Time: 9:30 a.m. to 8:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: In Person and Virtual Meeting.

Contact Person: Lisa Steele, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 3139, MSC 7770, Bethesda, MD 20892, (301) 257-2638, steeleln@csr.nih.gov.

Name of Committee: Infectious Diseases and Immunology A Integrated Review Group; Bacterial Virulence Study Section.

Date: June 25–26, 2024.

Time: 10:00 a.m. to 8:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Rockledge II, 6701 Rockledge Drive, Bethesda, MD 20892.

Meeting Format: Virtual Meeting.

Contact Person: Susan Daum, Ph.D., Scientific Review Officer, Center for Scientific Review, National Institutes of Health, 6701 Rockledge Drive, Room 3202, Bethesda, MD 20892, 301-827-7233, susan.boyle-vavra@nih.gov.

(Catalogue of Federal Domestic Assistance Program Nos. 93.306, Comparative Medicine; 93.333, Clinical Research, 93.306, 93.333, 93.337, 93.393–93.396, 93.837–93.844, 93.846–93.878, 93.892, 93.893, National Institutes of Health, HHS)

Dated: May 23, 2024.

David W. Freeman,

Supervisory Program Analyst, Office of Federal Advisory Committee Policy.

[FR Doc. 2024-11853 Filed 5-29-24; 8:45 am].

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Center for Complementary & Integrative Health; Notice of Closed Meeting

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of the following meeting.

The meeting will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), Title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: National Center for Complementary and Integrative Health Special Emphasis Panel; NCCIH Training and Education Review Panel (CT).

Date: June 24, 2024

Time: 9:30 a.m. to 5:00 p.m.

Agenda: To review and evaluate grant applications.