Stanford

William Gilly

Professor of Biology

Bio

ACADEMIC APPOINTMENTS

- Professor, Biology
- Member, Bio-X
- Affiliate, Stanford Woods Institute for the Environment
- Member, Wu Tsai Neurosciences Institute

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Co-Director, SURMAR/ASIMAR (The Ocean Foundation) (2008 - present)
- External Advisory Board member, Puerto Rico Center for Enviornmental Neuroscience (PRCEN), Univ. Puerto Rico (2012 - present)
- Board member, Western Flyer Foundation (2016 - present)

PROFESSIONAL EDUCATION

- Postdoctoral, University of Pennsylvania , Biology, Physiology (1979)
- PhD, Washington University School of Medicine, Yale University School of Medicine , Physiology and Biophysics (1978)
- BSE, Princeton University , Electrical Engineering (1972)

COMMUNITY AND INTERNATIONAL WORK

- Squids4Kids, Pacific Grove, CA
- Sustainable Utilization and Research of Mar de Cortes (SURMAR), Santa Rosalia, BCS, Mexico

LINKS

- Lab site: https://gillylab.stanford.edu/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

My group was the first (and only) to deploy pop-up satellite tags and video packages (National Geographic Crittercam) on large Humboldt squid to record their second-to-second movements and color-changing behaviors. This work showed that this active predator spends a great deal of its time at depths of 300 m or more where the oxygen concentration is extremely low – less than 10% of that at the surface. This ‘oxygen minim zone’ (OMZ) is found throughout the southern half of the Gulf of California and much of the eastern Pacific Ocean, including Monterey Bay. The OMZ has been moving closer to the sea surface over the last few decades, and this aspect of marine climate change is expected to have major ecological consequences as ocean’s oxygenated surface zone becomes increasingly vertically compressed.

Our work in the Gulf of California has recently focused on the relationship between the size of Humboldt squid and environmental variation, particularly temperature at depth. Since an unusual El Niño event in 2009-10, the temperature at depths of up to 100 m has been increasing, and squid have responded by attaining maturity at a vastly smaller size and younger age than they had before 2009. Small size at maturity is normally a characteristic phenotype of this species in the tropical eastern Pacific, and the change in the squid's life history in the Sea of Cortez is consistent with the decreasing productivity and increasing temperatures observed over the last 6 years. Humboldt squid are telling us that the Gulf of California may be changing from a seasonally highly productive, upwelling-driven system to a low productivity tropical system.

Current laboratory work on squid chromatophores uses methods of electrophysiology, cell and molecular biology and electron microscopy, through collaborations with Univ. Puerto Rico, Univ. North Carolina Chapel Hill and Univ. Kansas. A major hypothesis guiding the work is that a "horizontal" pathway for communication between chromatophores exists in the plane of the skin, and that this network can mediate chromogenic behaviors in the absence of descending motor control by the central nervous system. We use a comparative approach to take advantage of natural differences in behavioral capabilities of Humboldt squid (Dosidicus gigas) and CA market squid (Doryteuthis opalescens) that inhabit environments with extremely different visual features. Market squid are a coastal species that use spatial patterning of chromatophore displays to provide camouflage in order to match benthic features like seaweed and rocks. Humboldt squid are an open ocean species that primarily generate temporal patterning and use spatially global flashing in intra-specific signaling. We hypothesize that these striking behavioral differences will be reflected in structural and functional elements of the peripheral control pathway.

Another project examines the role of the giant axon system in controlling escape responses in both Dosidicus and Doryteuthis, with a focus on sensitivity of the system to temperature and hypoxia. Both of these environmental variables are relevant to these species in the ocean. Methods used include electrophysiology, anatomy and particle image velocimetry.

Laboratory work is carried out both at Hopkins Marine Station and at our lab facility in Santa Rosalia, BCS, Mexico.

PROJECTS

- Natural Chromogenic Behaviors of Squid in Oceanic Waters - Stanford Univesity (6/1/2014 - 5/31/2017)
- Collaborative Research: Structural and Functional Connectivity of Squid Chromatophores - Stanford Univesity (7/1/2016 - 6/30/2019)
- Variations in water column properties of the Sea of Cortez in relation to ecosystem and climate dynamics - Stanford University and SURMAR (The Ocean Foundation) (12/1/2015 - November 30, 2018)

Teaching

COURSES

2020-21

- Views of a Changing Sea: Literature & Science: BIO 3N (Spr)

2019-20

- Views of a Changing Sea: Literature & Science: BIO 3N (Spr)

2018-19

- Science Meets Literature on the Monterey Peninsula: BIOHOPK 158H, BIOHOPK 258H, ENGLISH 158H (Spr)
- Views of a Changing Sea: Literature & Science: BIO 3N (Spr)

2017-18

- Physiology: BIOHOPK 84 (Spr)
- Views of a Changing Sea: Literature & Science: BIO 3N (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Jose Andrade Lopez

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (Phd Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Same-sex sexual behaviour in an oceanic ommastrephid squid, Dosidicus gigas (Humboldt squid)** *MARINE BIOLOGY*
  Hoving, H. T., Fernandez-Alvarez, F. A., Portner, E. J., Gilly, W. F.
  2019; 166 (3)
- **Grouping reduces the metabolic demand of a social squid** *Marine Ecology Progress Series*
  Burford, B. P., Carey, N., Gilly, W. F., Goldbogen, J. A.
  2019; 612: 141-150
- **Functionally driven modulation of sarcomeric structure and membrane systems in the fast muscles of a copepod (Gaussia princeps).** *Anatomical record (Hoboken, N.J. : 2007)*
  Glaser, N., Iyer, R., Gilly, W. F., Franzini-Armstrong, C.
  2018
- **A Buoyancy-Controlled Lagrangian Camera Platform for In Situ Imaging of Marine Organisms in Midwater Scattering Layers** *IEEE JOURNAL OF OCEANIC ENGINEERING*
  Berkenpas, E. J., Henning, B. S., Shepard, C. M., Turchik, A. J., Robinson, C. J., Portner, E. J., Li, D. H., Daniel, P. C., Gilly, W. F.
  2018; 43 (3): 595–607
- **The journey of squid sperm** *REVIEWS IN FISH BIOLOGY AND FISHERIES*
  Fernandez-Alvarez, F. A., Villanueva, R., Hoving, H. T., Gilly, W. F.
  2018; 28 (1): 191–99
- **Myogenic activity and serotonergic inhibition in the chromatophore network of the squid Dosidicus gigas (family Ommastrephidae) and Doryteuthis opalescens (family Loliginidae)** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Rosen, H. E., Gilly, W. F.
  2017; 220 (24): 4669–80
- **Morphological description of egg masses and hatchlings of Lolliguncula diomedeae (Cephalopoda: Loliginidae)** *JOURNAL OF MOLLUSCAN STUDIES*
  Fernandez-Alvarez, F. A., Li, D. H., Portner, E., Villanueva, R., Gilly, W. F.
  2017; 83: 194-199
- **Prolonged decline of jumbo squid (Dosidicus gigas) landings in the Gulf of California is associated with chronically low wind stress and decreased chlorophyll a after El Nino 2009-2010** *FISHERIES RESEARCH*
  Robinson, C. J., Gomez-Gutierrez, J., Markaida, U., Gilly, W. F.
  2016; 173: 128-138
- **Cephalopods of Pacific Latin America** *FISHERIES RESEARCH*
  Markaida, U., Gilly, W. F.
  2016; 173: 113-121
- **Chromogenic behaviors of the Humboldt squid (Dosidicus gigas) studied in situ with an animal-borne video package.** *journal of experimental biology*
  Rosen, H., Gilly, W., Bell, L., Abernathy, K., Marshall, G.
  2015; 218: 265-275
- **Evolutionary history of a complex adaptation: Tetrodotoxin resistance in salamanders** *EVOLUTION*

Hanifin, C. T., Gilly, W. F.
2015; 69 (1): 232-244

- **Combined climate- and prey-mediated range expansion of Humboldt squid (Dosidicus gigas), a large marine predator in the California Current System.** *Global change biology*
  Stewart, J. S., Hazen, E. L., Bograd, S. J., Byrnes, J. E., Foley, D. G., Gilly, W. F., Robison, B. H., Field, J. C.
  2014; 20 (6): 1832-1843

- **Aperture effects in squid jet propulsion** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Staaf, D. J., Gilly, W. F., Denny, M. W.
  2014; 217 (9): 1588-1600

- **Foraging ecology and movement patterns of jumbo squid (Dosidicus gigas) in the California Current System** *DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY*
  Field, J. C., Elliger, C., Baltz, K., Gillespie, G. E., Gilly, W. F., Ruiz-Cooley, R. I., Pearse, D., Stewart, J. S., Matsubu, W., Walker, W. A.
  2013; 95: 37-51

- **Onshore-offshore movement of jumbo squid (Dosidicus gigas) on the continental shelf** *DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY*
  Stewart, J. S., Gilly, W. F., Field, J. C., Payne, J. C.
  2013; 95: 193-196

- **Behavioral ecology of jumbo squid (Dosidicus gigas) in relation to oxygen minimum zones** *DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY*
  Stewart, J. S., Field, J. C., Markaida, U., Gilly, W. F.
  2013; 95: 197-208

- **Squid rocket science: How squid launch into air** *DEEP-SEA RESEARCH PART II-TOPICAL STUDIES IN OCEANOGRAPHY*
  O'Dor, R., Stewart, J., Gilly, W., Payne, J., Borges, T. C., Thys, T.
  2013; 95: 113-118

- **Extreme plasticity in life-history strategy allows a migratory predator (jumbo squid) to cope with a changing climate** *GLOBAL CHANGE BIOLOGY*
  Hoving, H. T., Gilly, W. F., Markaida, U., Benoit-Bird, K. J., Brown, Z. W., Daniel, P., Fieldk, J. C., Parassenti, L., Liu, B., Campos, B.
  2013; 19 (7): 2089-2103

- **Oceanographic and biological effects of shoaling of the oxygen minimum zone.** *Annual review of marine science*
  Gilly, W. F., Beman, J. M., Litvin, S. Y., Robison, B. H.
  2013; 5: 393-420

- **Oceanographic and Biological Effects of Shoaling of the Oxygen Minimum Zone** *ANNUAL REVIEW OF MARINE SCIENCE, VOL 5*
  Gilly, W. F., Beman, J. M., Litvin, S. Y., Robison, B. H.
  2013; 5: 393-420

- **Distribution of ommastrephid paralarvae in the eastern tropical Pacific** *FISHERY BULLETIN*
  Staaf, D. J., Redfern, J. V., Gilly, W. F., Watson, W., Ballance, L. T.
  2013; 111 (1): 78-89

- **Locomotion and behavior of Humboldt squid, Dosidicus gigas, in relation to natural hypoxia in the Gulf of California, Mexico** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Gilly, W. F., Zeidberg, L. D., Booth, J. A., Stewart, J. S., Marshall, G., Abernathy, K., Bell, L. E.
  2012; 215 (18): 3175-3190

- **Natural intrusions of hypoxic, low pH water into nearshore marine environments on the California coast** *CONTINENTAL SHELF RESEARCH*
  Booth, J. A., McPhee-Shaw, E. E., Chua, P., Kingsley, E., Denny, M., Phillips, R., Bograd, S. J., Zeidberg, L. D., Gilly, W. F.
  2012; 45: 108-115

- **Coordinated nocturnal behavior of foraging jumbo squid Dosidicus gigas** *MARINE ECOLOGY PROGRESS SERIES*
  Benoit-Bird, K. J., Gilly, W. F.
  2012; 455: 211-228

- **Marine predator migration during range expansion: Humboldt squid Dosidicus gigas in the northern California Current System** *MARINE ECOLOGY PROGRESS SERIES*
  Stewart, J. S., Hazen, E. L., Foley, D. G., Bograd, S. J., Gilly, W. F.
  2012; 471: 135-150

- **Egg capsule hatch rate and incubation duration of the California market squid, Doryteuthis (= Loligo) opalescens: insights from laboratory manipulations** *MARINE ECOLOGY-AN EVOLUTIONARY PERSPECTIVE*
  Zeidberg, L. D., Isaac, G., Widmer, C. L., Neumeister, H., Gilly, W. F.
  2011; 32 (4): 468-479

- **Diversity of conotoxin types from Conus californicus reflects a diversity of prey types and a novel evolutionary history** *TOXICON*
  Elliger, C. A., Richmond, T. A., Lebaric, Z. N., PIERCE, N. T., Sweedler, J. V., Gilly, W. F.
  2011; 57 (2): 311-322

- **A diverse family of novel peptide toxins from an unusual cone snail, Conus californicus** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Gilly, W. F., Richmond, T. A., Duda, T. F., Elliger, C., Lebaric, Z., Schulz, J., Bingham, J. P., Sweedler, J. V.
  2011; 214 (1): 147-161

- **Effects of temperature on embryonic development of the Humboldt squid Dosidicus gigas** *MARINE ECOLOGY PROGRESS SERIES*
  Staaf, D. J., Zeidberg, L. D., Gilly, W. F.
  2011; 441: 165-175

- **Horizontal movements, vertical-habitat utilization and diet of the jumbo squid (Dosidicus gigas) in the Pacific Ocean off Baja California Sur, Mexico** *International Symposium on Climate Impacts on Oceanic Top Predators (CLIOTOP)*
  Bazzino, G., Gilly, W. F., Markaida, U., Salinas-Zavala, C. A., Ramos-Castillejos, J.
  PERGAMON-ELSEVIER SCIENCE LTD.2010: 59–71

- **Ommastrephid squids Sthenoteuthis oualaniensis and Dosidicus gigas in the eastern Pacific show convergent biogeographic breaks but contrasting population structures** *MARINE ECOLOGY PROGRESS SERIES*
  Staaf, D. J., Ruiz-Cooley, R. I., Elliger, C., Lebaric, Z., Campos, B., Markaida, U., Gilly, W. F.
  2010; 418: 165-U587

- **FOOD AND FEEDING OF JUMBO SQUID DOSIDICUS GIGAS IN THE CENTRAL GULF OF CALIFORNIA DURING 2005-2007** *CalCOFI Conference 2007*
  Markaida, U., Salinas-Zavala, C. A., Rosas-Luis, R., Gilly, W. F., Booth, J. A.
  SCRIPPS INST OCEANOGRAPHY.2008: 90–103

- **Remembering the Gulf: changes to the marine communities of the Sea of Cortez since the Steinbeck and Ricketts expedition of 1940** *FRONTIERS IN ECOLOGY AND THE ENVIRONMENT*
  Sagarin, A. D., Gilly, W. F., Baxter, C. H., Burnett, N., Christensen, J.
  2008; 6 (7): 374-381

- **Oxygen declines and the shoaling of the hypoxic boundary in the California Current** *GEOPHYSICAL RESEARCH LETTERS*
  Bograd, S. J., Castro, C. G., Di Lorenzo, E., Palacios, D. M., Bailey, H., Gilly, W., Chavez, F. P.
  2008; 35 (12)

- **Natural egg mass deposition by the Humboldt squid (Dosidicus gigas) in the Gulf of California and characteristics of hatchlings and paralarvae** *JOURNAL OF THE MARINE BIOLOGICAL ASSOCIATION OF THE UNITED KINGDOM*
  Staaf, D. J., Camarillo-Coop, S., Haddock, S. H., Nyack, A. C., Payne, J., Salinas-Zavala, C. A., Seibel, B. A., Trueblood, L., Widmer, C., Gilly, W. F.
  2008; 88 (4): 759-770

- **Controlled and in situ target strengths of the jumbo squid Dosidicus gigas and identification of potential acoustic scattering sources** *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA*
  Benoit-Bird, K. J., Gilly, W. F., Au, W. W., Mate, B.
  2008; 123 (3): 1318-1328

- **Diving behavior of sperm whales in relation to behavior of a major prey species, the jumbo squid, in the Gulf of California, Mexico** *MARINE ECOLOGY PROGRESS SERIES*
  Davis, R. W., Jaquet, N., Gendron, D., Markaida, U., Bazzino, G., Gilly, W.
  2007; 333: 291-302

- **Two toxins from Conus striatus that individually induce tetanic paralysis** *BIOCHEMISTRY*
  Kelley, W. P., Schulz, J. R., Jakubowski, J. A., Gilly, W. F., Sweedler, J. V.
  2006; 45 (47): 14212-14222
- **Vertical and horizontal migrations by the jumbo squid Dosidicus gigas revealed by electronic tagging** *MARINE ECOLOGY PROGRESS SERIES*
  Gilly, W. F., Markaida, U., Baxter, C. H., Block, B. A., Boustany, A., Zeidberg, L., Reisenbichler, K., Robison, B., Bazzino, G., SALINAS, C.
  2006; 324: 1-17
- **Spawning by jumbo squid Dosidicus gigas in San Pedro Martir basin, Gulf of California, Mexico** *MARINE ECOLOGY PROGRESS SERIES*
  Gilly, W. F., Elliger, C. A., Salinas, C. A., Camarilla-Coop, S., Bazzino, G., Beman, M.
  2006; 313: 125-133
- **Piscivorous behavior of a temperate cone snail, Conus californicus** *BIOLOGICAL BULLETIN*
  STEWART, J., Gilly, W. F.
  2005; 209 (2): 146-153
- **Intraspecific variation of venom injected by fish-hunting Conus snails** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Jakubowski, J. A., Kelley, W. P., Sweedler, J. V., Gilly, W. F., Schulz, J. R.
  2005; 208 (15): 2873-2883
- **Decrease in inflammatory hyperalgesia by herpes vector-mediated knockdown of Na(v)1.7 sodium channels in primary afferents** *HUMAN GENE THERAPY*
  Yeomans, D. C., Levinson, S. R., Peters, M. C., Koszowski, A. G., Tzabazis, A. Z., Gilly, W. F., Wilson, S. P.
  2005; 16 (2): 271-277
- **Tagging studies on the jumbo squid (Dosidicus gigas) in the Gulf of California, Mexico** *FISHERY BULLETIN*
  Markaida, U., Rosenthal, J. J., Gilly, W. F.
  2005; 103 (1): 219-226
- **The projectile tooth of a fish-hunting cone snail: Conus catus injects venom into fish prey using a high-speed ballistic mechanism** *BIOLOGICAL BULLETIN*
  Schulz, J. R., Norton, A. G., Gilly, W. F.
  2004; 207 (2): 77-79
- **A gastropod toxin selectively slows early transitions in the Shaker K channel's activation pathway** *JOURNAL OF GENERAL PHYSIOLOGY*
  Sack, J. T., Aldrich, R. W., Gilly, W. F.
  2004; 123 (6): 685-696
- **All roads lead to arginine: The squid protamine gene** *JOURNAL OF MOLECULAR EVOLUTION*
  Lewis, J. D., de Jong, M. E., Bagha, S. M., Tang, A., Gilly, W. F., Ausio, J.
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- **Characterization of a novel gastropod toxin (6-bromo-2-mercaptotryptamine) that inhibits shaker K channel activity** *JOURNAL OF BIOLOGICAL CHEMISTRY*
  Kelley, W. P., Wolters, A. M., Sack, J. T., Jockusch, R. A., Jurchen, J. C., Williams, E. R., Sweedler, J. V., Gilly, W. F.
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  Rosenthal, J. J., Gilly, W. F.
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- **Inactivation and pharmacological properties of sqKv1A homotetramers in Xenopus oocytes cannot account for behavior of the squid "delayed rectifier" k(+) conductance** *BIOPHYSICAL JOURNAL*
  Jerng, H. H., Gilly, W. F.
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- **Selective open-channel block of Shaker (Kv1) potassium channels by S-nitrosodithiothreitol (SNDTT)** *JOURNAL OF GENERAL PHYSIOLOGY*
  Brock, M. W., Mathes, C., Gilly, W. F.
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- **Interaction of a toxin from the scorpion Tityus serrulatus with a cloned K+ channel from squid (sqKv1A)** *BIOCHEMISTRY*
  Ellis, K. C., Tenenholz, T. C., Jerng, H., Hayhurst, M., Dudlak, C. S., Gilly, W. F., Blaustein, M. P., Weber, D. J.
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- **Mass spectrometric survey of peptides in cephalopods with an emphasis on the FMRFamide-related peptides** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Sweedler, J. V., Li, L. J., Floyd, P., Gilly, W.
  2000; 203 (23): 3565-3573
- **Role of prey-capture experience in the development of the escape response in the squid Loligo opalescens: A physiological correlate in an identified neuron** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Preuss, T., Gilly, W. F.
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- **A family of delayed rectifier Kv1 cDNAs showing cell type-specific expression in the squid stellate ganglion giant fiber lobe complex** *JOURNAL OF NEUROSCIENCE*
  Rosenthal, J. J., Liu, T. I., Gilly, W. F.
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- **Fast and slow activation kinetics of voltage-gated sodium channels in molluscan neurons** *JOURNAL OF NEUROPHYSIOLOGY*
  Gilly, W. F., Gillette, R., McFarlane, M.
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- **Fast inactivation of delayed rectifier K conductance in squid giant axon and its cell bodies** *JOURNAL OF GENERAL PHYSIOLOGY*
  Mathes, C., Rosenthal, J. J., Armstrong, C. M., Gilly, W. F.
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- **All-or-none contraction and sodium channels in a subset of circular muscle fibers of squid mantle** *BIOLOGICAL BULLETIN*
  Gilly, W. F., Preuss, T., McFarlane, M. B.
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- **Molecular identification of SqKv1A - A candidate for the delayed rectifier K channel in squid giant axon** *JOURNAL OF GENERAL PHYSIOLOGY*
  ROSENTHAL, J. C., Vickery, R. G., Gilly, W. F.
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- **QUANTIFICATION OF L-DOPA AND DOPAMINE IN SQUID INK - IMPLICATIONS FOR CHEMORECEPTION** *BIOLOGICAL BULLETIN*
  Lucero, M. T., Farrington, H., Gilly, W. F.
  1994; 187 (1): 55-63
- **AMINO-ACID-SEQUENCE OF A PUTATIVE SODIUM-CHANNEL EXPRESSED IN THE GIANT-AXON OF THE SQUID LOLIGO-OPALESCENS** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Rosenthal, J. J., Gilly, W. F.
  1993; 90 (21): 10026-10030
- **ELECTRICAL RESPONSES TO CHEMICAL-STIMULATION OF SQUID OLFACTORY RECEPTOR-CELLS** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Lucero, M. T., Horrigan, F. T., Gilly, W. F.
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- **ACCESS RESISTANCE AND SPACE CLAMP PROBLEMS ASSOCIATED WITH WHOLE-CELL PATCH CLAMPING** *METHODS IN ENZYMOLOGY*
  Armstrong, C. M., Gilly, W. F.
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- **BEHAVIORAL-RESPONSES TO CHEMICAL-STIMULATION OF THE OLFACTORY ORGAN IN THE SQUID LOLIGO-OPALESCENS** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Gilly, W. F., Lucero, M. T.

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- **DEVELOPMENT OF GIANT MOTOR AXONS AND NEURAL CONTROL OF ESCAPE RESPONSES IN SQUID EMBRYOS AND HATCHLINGS** *BIOLOGICAL BULLETIN*
  Gilly, W. F., Hopkins, B., Mackie, G. O.
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- **JET-PROPELLED ESCAPE IN THE SQUID LOLIGO-OPALESCENS - CONCERTED CONTROL BY GIANT AND NON-GIANT MOTOR AXON PATHWAYS** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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- **CHARGE MOVEMENT AND DEPOLARIZATION CONTRACTION COUPLING IN ARTHROPOD VS VERTEBRATE SKELETAL-MUSCLE** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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- **MORPHOLOGICAL AND PHYSIOLOGICAL-PROPERTIES OF NON-STRIATED MUSCLE FROM THE TUNICATE, CIONA-INTESTINALIS - PARALLELS WITH VERTEBRATE SKELETAL-MUSCLE** *TISSUE & CELL*
  Nevitt, G., Gilly, W. F.
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  TUFT, P. J., Gilly, W. F.
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- **MECHANICAL-PROPERTIES AND CONTROL OF NON-MUSCULAR CATCH IN SPINE LIGAMENTS OF THE SEA-URCHIN, STRONGYLOCENTROTUS-FRANCISCANUS** *JOURNAL OF EXPERIMENTAL BIOLOGY*
  Diab, M., Gilly, W. F.
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- **THRESHOLD CHANNELS - A NOVEL TYPE OF SODIUM-CHANNEL IN SQUID GIANT-AXON** *NATURE*
  Gilly, W. F., Armstrong, C. M.
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- **CONTRACTILE ACTIVATION IN SCORPION STRIATED-MUSCLE FIBERS - DEPENDENCE ON VOLTAGE AND EXTERNAL CALCIUM** *JOURNAL OF GENERAL PHYSIOLOGY*
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