OMB No. 0925-0001 and 0925-0002 (Rev. 03/2020 Approved Through 02/28/2023)

BIOGRAPHICAL SKETCH

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NAME: Yali Kong, Ph.D.

eRA COMMONS USER NAME (credential, e.g., agency login): YALIKONG

POSITION TITLE: Senior Research Scientist

EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)

| INSTITUTION AND LOCATION | DEGREE  (if applicable) | Completion Date  MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| Zhengzhou University, Zhengzhou, China | B.S. | 1991 | Chemistry |
| Nankai University, Tianjin, China  Peking University, Beijing, China | M.S.  Ph.D. | 1994  1997 | Organic Chemistry  Organic Chemistry |
| Univ. of Virginia, Charlottesville, VA | Postdoctoral | 2000 | Medicinal Chemistry |

1. **Personal Statement**

Dr. Yali Kong is a medicinal chemist with more than fifteen years of experience in drug discovery and development. She has served as the lead chemist on more than 15 synthetic projects including the discovery of anti-cancer agents on several high profile publications. Dr. Kong synthesized the compound YK-4-250 (a novel small molecule targeting the angiotensin AT1 receptor), that will be used in this proposal to elucidated the pathobiology of the COVID-19 infection in the gastrointestinal (GI) system. Dr. Kong is listed as an inventor of YK-4-250 leading to an issued patent. The compound had demonstrated promising therapeutic effects as a mitigator of radiation toxicity, anti-inflammation and anti-viral infection. With extensive experience in organic synthesis, Dr. Kong conducted the synthesis of many small molecules from milligram scale to multi gram scale synthesis to enable and support *in vivo* preclinical studies. Her collaborative team research has resulted many high impacted journal publications, grant funding and issued patents.

With her professional training in organic chemistry and medicinal chemistry field, Dr. Kong has developed other major synthetic discoveries including the first boronic acid analogs as tubulin inhibitors featured with the cover page publication in *Chem. & Bio*. She successfully synthesized the first fluorescent HDAC shuttling inhibitors such as YK-4-272. Dr. Kong designed and synthesized a small molecule YK-4-279, the first reported inhibitor of the Ewing’s Sarcoma oncogene EWS-FLI1 interactions with RHA helicase (*Nature Medicine, 2009, 15 (7), 750-756*). The small molecule YK-4-279 was also featured by Helen Pickersgill as the Editors' Choice for “Highlights of the recent literature in Biomedicine” in the article entitled: *Inhibiting Interactions*. (*Science 7 August 2009 325: 657*).

Dr. Kong served as PI on CCSG internal grant for the development of small molecule inhibitors for hepatitis C virus. Dr. Kong has been active involved with other collaborators in several NIH and DOD funded grants in the past. Dr. Kong will participate in this proposal as key personnel to provide her expertise and be responsible for the progress of this project.

1. **Positions and Honors**

1997-2000 Assistant Professor of Chemistry, Peking University, Beijing, China

2003-2006 Research Scientist, Department of Chemistry, University of Virginia, Charlottesville, VA

2006-2017 Assistant Professor, Department of Oncology, Georgetown University, Washington DC

2006-2017 Medicinal Chemistry Team Leader, Drug Discovery Program, Georgetown University Medical Center, Washington DC

2009-2017 Associate Member, Lombardi Comprehensive Cancer Center, Georgetown University Medical Center, Washington DC

2017-2019 Senior Research Scientist, Center for Drug Discovery and Development, Inova Schar Cancer Institute

2020- Senior Research Scientist, College of Science, George Mason University

**Honors /Awards**

1989-1991 Undergraduate Student Scholarship and Outstanding Student Award, Zhengzhou University, Zhengzhou, China

1991 Outstanding Dissertation Award, Zhengzhou University, Zhengzhou, China

1992-1994 Guanghua Graduate Student Scholarship, Nankai University, Tianjin, China

1997-1998 Distinguished Teaching Award, Peking University, Beijing, China

2003- Member, the American Chemical Society

2014- Reviewer, Chemistry of Heterocyclic

2014- Member, National Academy of Inventors

2017- US-Egypt grant reviewer

2017- PR-INBRE (Puerto Rico-Idea Networks of Biomedical Research Excellence) grant reviewer

1. **Contributions to Science**
2. Discovery of novel tissue targeted antioxidants as radiation mitigators and therapies for COVID-19..

Dr. Kong developed a series of novel conjugated small molecules such as **YK-4-250** with tissue targeted antioxidant activity. The further biological evaluation of **YK-4-250** led to an issued patent and demonstrated promising therapeutic effects as a mitigator of radiation toxicity, anti-inflammation and anti-viral infection.

**Awarded Patent (Co-inventor)**

* US 9,233,949 B2, Brown, M. L**.; Kong, Y**.; Wilcox, C. S. US 9,233,949 B2 Treatment for Oxidative Stress and/or Hypertension, issued: Jan. 12, 2016
* Radiation Protectors, US 2015/0044293 A1, Issued: Feb 12, 2015

**Publications**

* Milton L. Brown,† Sripathi M. Sureban,† **Yali Kong**,† Shuo Tian,† Edwin Bannerman-Menson, Stanton Dulan, Randal May, Landon L. Moore, Kamille Pitts, Kai Ding, Weisheng Wang, Guanhua Du, Dongfeng Qu, Parthasarathy Chandrakesan, Courtney W. Houchen. YK-4-250, a novel long-acting tempol, acts as radiation mitigator, prevents gut acute radiation syndrome, and promotes overall survival following radiation injury. *International Journal of Radiation Oncology, Biology, Physics*. 2020, in review
* Sripathi M. Sureban, Parthasarathy Chandrakesan, Yali Kong, Randal May, Dongfeng Qu, Nathaniel Weygant, Milton Brown, Courtney W. Houchen. 197 Tempol, Telmisartan, and Yk-4-250 Act As Radiation Mitigators, Prevent GI Acute Radiation Syndrome, and Promote Overall Survival Following Radiation Injury. Gastroenterology. April 2016. Volume 150, Issue 4, Supp. 1, pg. S51–S52. DOI: https://doi.org/10.1016/S0016-5085(16)30298-0

1. Synthesis of small molecule YK-4-279 as a potent disruptor of EWS-FLI1 interaction with RNA helicase A in Ewing’s Sarcoma.

Dr. Kong synthesized the first reported inhibitor of EWS-FLI1 interactions with RHA helicase and the lead compound YK-4-279 and all analogs were reported in Erkizan, H.V et al. *Nature Medicine* 2009. Dr. Kong managed the medicinal chemistry team in the optimization of YK-4-279 that lead to PT-1-17 as reported in Tosso, P.N. et al. *J. Med. Chem*. 2014. Dr. Kong lead the medicinal chemistry teams from hit identification, hit optimization and performing chemistry for gram scale synthesis of the compound YK-4-279 for advancement in pre-clinical trials. Her chemistry on this target is featured in several high profile journals (see selected publications), supported by NIH funding and led to patents.

* Erkizan, H. V.; **Kong, Y**.; Merchant, M.; Schlottmann, S.; Barber, J. S.; Abaan, O. D.; Chou, T.; Dakshanamurthy, S.; Brown, M. L.; Uren, A.; Toretsky, J. A. Small molecule designed to disrupt oncogenic transcription factor EWS-FLI1 interaction with RNA helicase A inhibits Ewing’s Sarcoma; *Nature Medicine*, **2009**, 15 (7), 750-756. \*\***Featured as the Editors' Choice** for “*Highlights of the recent literature in Biomedicine*” in the article by Helen Pickersgill entitled: Inhibiting Interactions. Science 7 August 2009 325: 657.
* Awad, O.; Yustein, J. T.; Shah, P.; GuI, N.; Katuri, V.; O’Neill, A.; **Kong, Y**.; Brown, M. L.; Toretsky, J. A.; Loeb, D. M. High ALDH activity identifies chemotherapy-resistant Ewing’s Sarcoma stem cells that retain sensitivity to EWS-FLI1 inhibition; *Plos One*; **2010**, 5(11), e13943.
* Rahim, S.; Beauchamp, E. M.; **Kong, Y.**; Brown, M. L.; Toretsky, J. A.; Üren, A. YK-4-279 inhibits ERG and ETV1 mediated prostate cancer cell invasion; *Plos One***, 2011**, 6(4), e19343.
* Barber-Rotenberg, J. S.; Selvanathan, S. P.; **Kong, Y**.; Erkizan, H. V.; Snyder, T. M.; Hong, S. P.; Kobs, C. L.; South, N. L.; Summer, S.; Monroe, P. J.; Chruszcz, M.; Dobrev, V.; Tosso, P. N.; Scher, L. J.; Minor, W.; Brown, M. L.; Metallo, S. J.; Üren, A.; Toretsky, J. A. Single enantiomer of YK-4-279 demonstrates specificity in targeting the oncogene EWS-FLI1. *Oncotarget*, **2012**, 3 (2), 172-182.
* Tosso, P. N.; **Kong, Y**.; Scher, L.; Cummings, R.; Schneider, J.; Rahim, S.; Paige, M.; Holman, K.T.; Wang, K.; Aykut Üren, A.; Jeffrey Toretsky, A.; Brown, M. L. Synthesis and Structure Activity Relationship Studies of Small Molecule Disruptors of EWS-FLI1 Interations in Ewing Sarcoma. *J. Med. Chem.* **2014**, 57 (24), 10290-10303.
* Rahim, S.; Minas, T.; Hong, S. H.; Justvig, S.; Çelik, H.; Kont, Y. S.; Han, J.; Abraham T. Kallarakal, A. T.; **Kong, Y**.; Rudek, M. A.; Brown, M. L.; Kallakury, B.; Toretsky, J. A.; Aykut Üren. A Small Molecule Inhibitor of ETV1, YK-4- 279, Prevents Prostate Cancer Growth and Metastasis in a Mouse Xenograft Model. *Plos One*; **2014**, 9(12), e114260.

**Awarded Patent (Co-inventor)**

* US 8,232,310 B2 Targeting of EWS-FLI1 as anti-tumor therapy, issued: Jul. 31, 2012

1. Discovery of novel histone deacetylase shuttling inhibitors.

Dr. Kong discovered and synthesized a new class of histone deacetylases (HDAC) inhibitors. These molecules inhibit the cytoplasmic to nuclear shuttling of class II HDACs. These are an important emerging class of drugs for the treatment of cancers and HDAC inhibitors are currently under evaluation in clinical trials as single agents and as sensitizers in combinations with chemotherapies and radiation therapy.

**Awarded Patent (Co-inventor)**

* US 8,293,513 B2 Histone Deacetylase Inhibitors, issued: Oct 23, 2012

**Selected Publications**

* **Kong, Y**.; Jung, M.; Kang, W.; Grindrod, S.; Velena, A.; Lee, S. A.; Dakshanamurthy, S.; Yang, Y.; Miessau, M.; Zheng, C.; Dritschilo, A.; Brown, M. L. Histone deacetylase cytoplasmic trapping by a novel fluorescent HDAC inhibitor; *Molecular Cancer Therapeutics*, **2011**, 10 (9), 1591-1599.
* Kong, H. S.; Tian, S.; **Kong, Y**.; Du, G.; Zhang, L.; Jung, M.; Dritschilo, A.; Brown, M. L. Preclinical Studies of YK-4-272, an Inhibitor of Class II Histone Deacetylases by Disruption of Nucleocytoplasmic Shuttling. Pharm. Res. 2012, 29 (12), 3373-83.

1. **Additional Information: Research Support and/or Scholastic Performance**

**Other Selected Publications**

1. Wu, Y.; Ding, K.; Yu, Z.; **Kong**, **Y**. the Kinetics and Mechanism of Mercuration of N-(Substituted Benzylidene)-4-toluidines; *Chinese Journal of Chemistry*, **1993**, *11*, 6.
2. **Kong, Y**.; He, M.; Jin, S.; He, X. Fast-Atom Bombardment Mass Spectrometry Study of N-Benzoyl Tauryl Amino Acids; Rapid Communications in Mass Spectrometry, **1997**, 11, 1731.
3. **Kong, Y**.; Jin, S. Synthesis and Crystallization of N-Benzoyl Tauryl Phenylalanine; Chinese Chemical Letters, **1997**, 8, 779.
4. **Kong, Y**.; Jin, S.; Jin, X.; Yang, Q. Synthesis and Crystal Structure of N-Benzoyl Tauryl Proline; Hecheng Huaxue, 1997, 5, 357.
5. Xie, G.; **Kong, Y**.; Wang, J.; Xu, X.; Jin, S. Studies on Crystal Structure, Conformation Analysis of a New Designed Hapten Containing Sulfur; Chemical Journal of Chinese Universities, **1999**, 20, 890.
6. **Kong**, **Y.**; Grembecka, J.; Edler, M. C.; Hamel, E.; Mooberry, S. L.; Sabat, M.; Rieger, J.; Brown, M. L. Structure Based Discovery of a Boronic Acid Bioisostere of Combretastatin A-4; *Chemistry & Biology.* **2005**, *12 (9)*, 1007-1014**. \*\*Featured as the cover**
7. Chruszcz, M.; **Kong**, **Y**.; Dauter, Z.; Brown, M. L.; Minor, W. 2 - Amino - 4 - (4 - Chloro - 3 - Methylphenyl) - 5 - Propyl - 1, 3 - Thiazolium Iodide. *Acta Crystallographica Section E: Structure reports online*; **2007**, *63 (4)*, o1598-o1600.
8. Gorcznski, M. J.; Grembecka, J.; Zhou, Y.; **Kong, Y**.; Roudaia, L.; Douvas, M. G.; Newman, M.; Bielnicka, I.; Baber, G.; Corpora, T.; Shi, j.; Sridharan, M.; Lilien, R.; Donald, B. R.; Speck, N. A.; Brown, M. L.; Bushweller, J. H. Allosteric Inhibition of the Protein-Protein Interaction Between the Leukemia-Associated Proteins Runx1 and; Chemistry & Biology; **2007**, 14 (10), 1186-1197. \*\*Featured as the cover.
9. **Kong, Y**.; Wang, K.; Edler, C. M.; Hamel, E.; Mooberry, S. L.; Paige, M. A.; Brown, M. L. A boronic acid chalcone analog of combretastatin A-4 as a potent anti-proliferation agent; *Bioorganic & Medicinal Chemistry*; **2010**, 18, 971-977.
10. Davis, G. C.; **Kong, Y**.; Paige, M.; Li, Z. Merrick, E. C.; Hansen, T.; Suy, S.; Wang, K.; Dakshanamurthy, S.; Cordova, A.; Mcmanus, O. B.; Williams, B. S.; Chruszcz, M.; Minor, W.; Patel, M. K.; Brown, M. L. Asymmetric synthesis and evaluation of a hydroxyphenylamide voltage gated sodium channel blocker in human prostate cancer xenograftes. Bioorganic & Medicinal Chemistry, **2012**, 20 (6), 2180-2188.
11. **Kong, Y**.; Yenugonda, V. M.; Deb, T. B.; Yang, Y.; Riggins, R. B.; Brown, M. L. Trans-resveratrol boronic acid exhibits enhanced anti-proliferative acitivity on estrogen-dependent MCF-7 breast cancer cells. Cancer Bio. Ther. **2012**, 13 (10), 925-34. (**Co-first author**).
12. Yi, Y. W.; Kang, H. J.; Kim, H. J.; **Kong, Y**.; Brown, M. L.; Bae, I. Targeting mutant p53 by a SIRT1 activator YK-3-237 inhibits the proliferation of triple-negative breast cancer cells. Oncotarget. **2013**, 4(7), 984-94.
13. Hou, S.; Yi, Y. W.; Kang, H. J.; Zhang, L.; Kim, H. J.; **Kong, Y**.; Bae, I.; Brown, M. L. Novel Carbazole Inhibits Phospho-STAT3 Through Induction of Protein Tyrosine Phosphatase PTPN6. J. Med. Chem. **2014**, 57(15), 6364-6353.
14. Kong, H.S.; Song, J.K.; Yenugonda, V.; Li, Z.; Shuo, T.; Cheema, A.; **Kong, Y**.; Du, G.H.; Brown, M.L. Preclinical Studies of the Potent and Selective Nicotinic α4β2 Receptor Ligand VMY-2-95. *Mol.Pharm*. **2015**, 12(2), 393-402.
15. Hou, S.; Liu, Y.; **Kong, Y**.; Brown, M. L. Total Synthesis of 7-Hydroxymurrayazolinie, Murrayamine D, and Mahanine via m-Nitro Group Activated Pyran Annulation. *Org. Lett*. **2015**, 15 (17), 2298-301.
16. Kinag, H. J.; Yi, Y. W.; Hou, S.; Kim, H. J.; **Kong, Y**.; Bae, I.; Brown, M. L. Disruption of Stat3-DNMT1 by SH-1-14 Induces Re-expression of Tumor Suppressor Genes and Inhibits Growth of Triple-Negative Breast Tumor. **2015**, Oncotarget, 4054.
17. **Kong, Y**.; Smith, J.; Li, K.; Cui, J. Han, J.; Hou, S.; Brown, M. L. Development of a novel near-infrared fluorescent theranostic Combretastatin A-4 analogue, YK-5-252, to target triple negative breast cancer, *Bioorganic & Medicinal Chemistry*; 2017, 25 (7), 2226-2233.

**Patents (Co-inventor)**

1. Toretsky, J. A.; Uren, A.; Brown, M. L.; **Kong, Y**. PCT Int. Appl. 128pp PIXXD2 WO 2008083326 A2 20080710 CAN 149:143936 AN 2008:829065. Targeting of EWS-FLI1 as anti-tumor therapy, **2008.**
2. Brown, M. L.; Jung, M. O.; Dritschilo, A.; **Kong, Y**. PCT Int. Appl. 96pp CODEN: PIXXD2 WO 2009079375 A1 20090625 AN. Histone deacetylase inhibitors useful in the treatment of various diseases and their preparation 1, **2009**.
3. Toretsky, J. A.; Uren, A.; Brown, M. L.; **Kong, Y**. PCT/US2007/089118 USXXCO US 20100004179 A1 20100107 CAN 152: 136702 AN 2010:18252. Targeting of EWS-FLI1 as anti-tumor therapy. 119pp., Cont.-in-part of Appl. No. PCT/US2007/089118, **2010**.
4. Brown, M. L.; **Kong, Y**.; Yenugonda, V. M. PCT Int. Appl. 85 pp PIXXD2 WO 2011022502 A1 20110224 CAN 154:284035 AN 2011:236462 Preparation of boronic acid derivatives of resveratrol for use in the treatment of cancer, **2011**.
5. Brown, M. L.; **Kong, Y**.; Wilcox, C. S. PCT Int. Appl. 65pp PIXXD2 WO 2011035110 A2 20110324 CAN 154:385281 AN 2011:373164. Preparation of tempol/telmisartan ester-linked adduct or tempamine/telmisartan amide-linked adduct for the treatment for oxidative stress and / or hypertension, **2011**.
6. Brown, M. L.; Jung, M. O.; Dakshanamurthy, S.; Henderson, F. C.; **Kong, Y**. PCT Int. Appl. WO 2011156632 A2 20111215. Preparation of imidazolopyrimidine derivatives and related compounds as P75 neurotrophin receptor modulators useful in treatment and prevention on vervouss system tumors. **2011**.
7. Brown, M. L.; **Kong, Y**.; Yong, L.; Glazer, R.; Tomita, Y.; PCT Int. Appl. WO 2012027482 A2 20120301. Compounds, compositions and methods related to PPAR antagonists, **2012**.
8. Toretsky, J. A.; Brown, M. L.; Tosso, P. N.; Üren, A.; **Kong, Y**. Preparation of indole derivatives, methods and compositions for treating Ewing’s sarcoma family of tumors. PCT Int. Appl. WO 20131017, **2013**.
9. Tosso, P. N.; Kong, Y.; Brown, M.L. Methods for determining binding to EWS-FLI1, **2014**, filed.
10. **Kong, Y**.; Hou, S.; Smith, J. Wang, K.; Brown, M. L. Glutathione-Cleavable Prodrugs and Methods of Use Thereof. Provisional Application No. 62/160,385. Filed on 05/12/**2015**

**Research Support**

No current research support

Completed Research Support

SAIC-Frederick 29XS130 Milton L. Brown (PI) 01/01/11-6/30/15

To provide one and one-half full-time equivalent (1.5 FTE) staff positions dedicated to the support and coordination of its internal CBC-related activities that are not related to specific projects, in order to meet the operational needs of the Consortium and its project activities.

Role: Y. Kong Key personnel

**R01 CA133662-01/05**  Jeff A. Toretsky (PI) 12/01/08-11/30/13

Novel Compounds to Inactivate Oncogenic Fusion Proteins.

RHA helicase cooperation with an oncogenic transcription factor is novel, thus we propose the following hypotheses to interrogate and expand our discovery. We hypothesize that the interaction of RHA with EWS-FLI1 results in a potent transcriptional activator/coactivator complex amplifying the functions of both proteins and together drive the malignant phenotype of ESFT.

Role: Co-Investigator

**R01-CA150646-01** Eliot. M. Rosen (PI) 02/09/10-12/31/14

Development of BRCA1-mimetic drugs for breast cancer

The major goals of this project are: 1) To determine the mechanism of action of BRCA1-mimetic compounds in human breast cancer cells. 2) To modify our lead compound to produce more potent analogs. 3) To test the lead compound and best analogs for their ability to inhibit estrogen-stimulated human breast cancer tumor growth *in vivo* in a xenograft model. 4) To test the activity of BRCA1-mimetic compounds in mouse genetic models of breast cancer.

Role: Y. Kong Co-Investigator

Georgetown Lombardi Cancer Center Support Grant (CCSG) Yali Kong 03/01/10-02/28/11

Development of Small Molecule Inhibitors for Hepatitis C Virus

The goal of this project is to design, synthesize and evaluate small molecules for hepatitis C Virus.

**Role: PI**