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Area of Expertise

The long term goal of our research is to investigate the biochemical mechanisms of redox imbalance stress and its role in adult-onset metabolic syndrome. In particular, we are studying how mitochondrial redox sensitive proteins respond to redox imbalance stress and explore such responses as potential therapeutic targets for fighting aging-related metabolic diseases. Our current projects are focused on two NADH/NAD-dependent mitochondrial proteins: dihydrolipoamide dehydrogenase (DLDH) and complex I (NADH-ubiquinone oxidoreductase), both of which can be simultaneously analyzed by blue native gel electrophoresis and also show adaptive responses to NADH/NAD redox imbalance stress under pathophysiological conditions.

The DLDH project studies its adaptive response as a viable druggable target for induction of stroke- or hypoxia tolerance and the mechanisms of this protein's oxidative modifications in redox signaling and neuroprotection.

The complex I project on studies the mechanisms of complex I adaptive hyperactivity observed in diabetic pancreas and other tissues with the goal of exploring strategies that down-regulating complex I hyperactivity by restoring NADH/NAD redox balance may serve as a therapeutic approach for treating diabetes mellitus.

Qualifications

MS in Biochemistry, Chinese Academy of Sciences

BS in Biochemistry, Peking University

PhD in Biochemistry, University of California at Berkeley

Recent Publications

Redox Imbalance and Mitochondrial Abnormalities in Kidney Disease

Yan, L. J., Mar 2022, In: *Biomolecules*. 12, 3, 476.

Activation of peripheral group III metabotropic glutamate receptors suppressed formalin-induced nociception

Li, Y. L., Chang, X. R., Ma, J. T., Zhao, X., Yin, L. T., Yan, L. J., Guo, J. H., Zhang, C. & Yang, X. R., Feb 2022, In: *Clinical and Experimental Pharmacology and Physiology*. 49, 2, p. 319-326 8 p.

Folic acid-induced animal model of kidney disease

Yan, L. J., Dec 2021, In: *Animal Models and Experimental Medicine*. 4, 4, p. 329-342 14 p.

Cadmium-induced kidney injury: Oxidative damage as a unifying mechanism

Yan, L. J. & Allen, D. C., Nov 2021, In: *Biomolecules*. 11, 11, 1575.

Comment on kobroob et al. Effectiveness of n-acetylcysteine in the treatment of renal deterioration caused by long-term exposure to bisphenol a. *biomolecules* 2021, 11, 655

Yan, L. J., Jun 2021, In: *Biomolecules*. 11, 6, 888.

NADH/NAD⁺ redox imbalance and diabetic kidney disease

Yan, L. J., May 2021, In: *Biomolecules*. 11, 5, 730.

Editorial: Diabetes and Obesity Effects on Lung Function

Chen, X. F., Yan, L. J., Lecube, A. & Tang, X., 16 Jul 2020, In: *Frontiers in Endocrinology*. 11, 462.

Urine Sample-Derived Cerebral Organoids Suitable for Studying Neurodevelopment and Pharmacological Responses

Lin, V. J. T., Hu, J., Zolekar, A., Yan, L. J. & Wang, Y. C., 14 May 2020, In: *Frontiers in Cell and Developmental Biology*. 8, 304.

Regulation of the SIRT1 signaling pathway in NMDA-induced Excitotoxicity

Yang, X., Sun, X., Wu, J., Ma, J., Si, P., Yin, L., Zhang, Y., Yan, L. J. & Zhang, C., 1 Apr 2020, In: Toxicology Letters. 322 , p. 66-76 11 p.

Neuroprotection of Cyperus esculentus L. orientin against cerebral ischemia/reperfusion induced brain injury

Jing, S. Q., Wang, S. S., Zhong, R. M., Zhang, J. Y., Wu, J. Z., Tu, Y. X., Pu, Y. & Yan, L. J., 1 Mar 2020, In: Neural Regeneration Research. 15, 3, p. 548-556 9 p.

Sponsored Projects

Analysis of Basal Metabolism and Brain Function in Children with Congenital Cardiovascular Disease: DLDH Activity, EEG Development and Hemodynamics

Yan, L.

Intramural Research (UAEM)

1/07/12 → 30/06/14

Dietary targeting of dihydrolipoamide dehydrogenase for stroke tolerance

Forster, M., Yan, L., FORSTER, M. J., YAN, L. & Yan, L.

National Institute of Neurological Disorders and Stroke

1/04/13 → 30/09/19

Dietary targeting of dihydrolipoamide dehydrogenase for stroke tolerance

Forster, M., Yan, L., Yan, L. & Forster, M.

1/04/13 → 30/09/19

Dietary Targeting of Dihydrolipoamide Dehydrogenase for Stroke Tolerance

Yan, L. & Yang, S.

NINDS: Neurological Disorders & Stroke

1/04/13 → 31/03/18

Mechanisms of Cognitive Decline During Aging - Project 1

Forster, M., Sumien, N. & Yan, L.

NIA: National Institute on Aging

1/03/13 → 29/02/16

Pancreatic Mitochondrial Complex I as a Target for Diabetes Therapy

Yan, L.

Intramural Research(UNTHSC)

1/05/16 → 31/08/17

Role of Transcellular Mitophagy in Diabetic Retinal Neurodegeneration

Yan, L. & Liu, Y.

Intramural Research(UNTHSC)

1/09/16 → 31/08/18

Role of Transcellular Mitophagy in Diabetic Retinal Neurodegeneration

Liu, Y. & Yan, L.

Intramural Research(UNTHSC)

1/09/16 → 31/08/18

Texas Center of Minority Health, Education, Research and Outreach - Project 2

Clay, P., Yan, L. & Suzuki, S.

NIMHD: Natl Institute on Minority Health

23/09/17 → 31/05/22

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