

Nano-formulation designed in nanomedicine: wound healing, vessel dilation, and malignant tumor

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The use of state-of-the-art noninvasive therapies at the organ level in modern medicine has gradually become possible. However, the treatment demands for spatially and temporally controlled noninvasive therapy at the cell level because nonspecific toxicity often causes complicated side effects. To mitigate the uncomfortable in patients, therapeutic approach and drugs are explored to achieve high specificity. This high specificity could be obtained by implementing stimuli-responsive nanoparticles in ultrasound- and photo-induced therapy. To refine this therapy and subsequently achieve high efficiency, novel nanomaterials can be designed and modified either to enhance the uptake and drug delivery to the lesion sites, or control treatment to administer therapy efficiently. These modifications and developments were presented in this talk for the achievement of the spatial and temporal control in vitro and in vivo. In particular, the gas-based therapy has been successfully employed using nano-carriers for malignant tumor,¹ cerebral vasodilation,^{2,3} and incisional wound healing.⁴

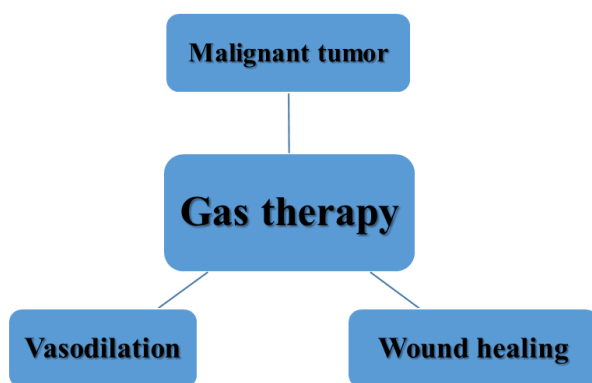


Figure. Nanostructures were developed for gas therapy against diseases.

References:

- [1] W.-P. Li, C.-H. Su, L.-C. Tsao, C.-T. Chang, Y.-P. Hsu and C.-S. Yeh, *ACS Nano*, **10** (2016) 11027.
- [2] W.-P. Li, C.-H. Su, C.-Y. Chang, Y.-J. Lin and C.-S. Yeh, *ACS Nano*, **10** (2016) 2017.
- [3] P.-T. Kao, I.-J. Lee, I. Liao and C.-S. Yeh, *Chem. Sci.*, **8** (2017) 291.
- [4] W.-P. Li, C.-H. Su, S.-J. Wang, F.-J. Tsai, C.-T. Chang, M.-C. Liao, C.-C. Yu, V. T.-T. Tran, C.-N. Lee, W.-T. Chiu, T.-W. Wong and C.-S. Yeh, *ACS Nano*, **11** (2017) 5826 – 5835.

CURRICULUM VITAE



| a. Personal details | | | | |
|-----------------------|-------|---|----------------|-------------|
| Full name | Title | First name | Second name(s) | Family name |
| | Prof | Chen-Sheng | | Yeh |
| Present position | | Chair Professor | | |
| Organisation/Employer | | Department of Chemistry, National Cheng Kung University | | |
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b. Professional positions held

| | |
|------------------|---|
| 2018- | Adjunct Chair Professor, Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung, Taiwan |
| 2017- | Chair Professor, Department of Chemistry, National Cheng Kung University, Tainan, Taiwan. |
| 2009, 2012, 2015 | Distinguished Professor (three times), Department of Chemistry, National Cheng Kung University, Tainan, Taiwan. |
| 2001 | Professor, Department of Chemistry, National Cheng Kung University, Tainan, Taiwan. |
| 1995-2001 | Associate Professor, Department of Chemistry, National Cheng Kung University, Tainan, Taiwan. |
| 1994-1995 | Postdoctoral fellow, Chemistry, Purdue University, U.S.A. |

c. Professional Activities

| | |
|-----------|---|
| 2016- | Consultant, Ministry of Education/ Department of Higher Education, Taiwan |
| 2014-2016 | Convener, Discipline of Chemistry, Ministry of Science and Technology, Taiwan |
| 2012-2013 | Panel Committee, Discipline of Chemistry, Ministry of Science and Technology, Taiwan |
| 2005-2010 | Coordinator, Ministry of Education, "Center for Biomedical Nanotechnology Education", Taiwan. |

d. Professional distinctions: Awards

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|------------|---|
| 2017 | Outstanding Technology Transfer Contribution Award (傑出技術移轉貢獻獎), Ministry of Science and Technology, Taiwan |
| 2017 | K.T. Li Honorary Scholar Award (李國鼎榮譽學者), National Cheng Kung University, Taiwan |
| 2016, 2010 | Two times for Outstanding Research Award(傑出獎), Ministry of Science and Technology, Taiwan |
| 2016 | Chair Professorship (傑出人才講座), Foundation for The Advancement of Outstanding Scholarship, Taiwan |
| 2014 | The Eleventh National Innovation Award of Institute for Biotechnology and Medicine Industry(國家新創獎), Taiwan |
| 2013 | The Industry Elite Award of Ministry of Economic Affairs in the Ninth Academic Nanotechnology (奈米菁英獎), Taiwan |

e. Present research/professional speciality

Professor Chen-Sheng Yeh has devoted himself to develop nanomaterials and the related nanotechnology since he was employed as a faculty in Department of Chemistry, National Cheng Kung University in 1995. Research has focused on the nano-structural synthesis and biomedical applications of nanomaterials in cancer therapy and imaging diagnostics.

- (1) List in the top 1% of highly cited authors in the general chemistry portfolio of journals of Royal Society of Chemistry, UK (up to date of 2017)
- (2) List in the top 10% of most highly cited authors in the general chemistry portfolio of journals of Royal Society of Chemistry (up to date of Feb. 2016).
- (3) Ranked as top 1% cited author in Taiwan in (Thomson Reuters) Essential Science Indicators (ESI) in material science field in 2012.