Dr. Wanchai De-Eknamkul

Curriculum Vitae

1. PERSONEL

Academic Position Professor

Business address Department of Pharmacognosy and
Pharmaceutical Botany
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2. EDUCATION

B.Sc.	(Biochemistry)	1974-1978, Chulalongkorn University, Bangkok, Thailand
M.Sc.	(Biochemistry)	1978-1980, Mahidol University, Bangkok, Thailand
Ph.D.	(Plant Biochemistry)	1982-1987, University of Guelph, Guelph, Canada Supervisor: Prof. Dr. Brian Ellis

Post Doc. Training (Biosynthesis of Natural Products)
1989-1990 with Prof. Dr. Meinhart H. Zenk, University of Munich, Munich, Germany

3. POSITIONS HELD

Head Research Group for Natural Product Biotechnology
Faculty of Pharmaceutical Sciences
Chulalongkorn University

4. MAJOR RESEARCH INTEREST

1. Biosynthesis and production of secondary products
2. Discovery of bioactive compounds from medicinal plants
3. Enzyme- and cell-based screening technologies for searching bioactive compounds
4. Quantitative analysis of active constituents in medicinal plants by various chromatographic techniques

5. HONORS AND AWARDS

- Germany's **Alexander von Humboldt Research Fellowship**, 1989-1990
- Japan's JSPS-UNESCO Visiting Scientist (The University of Tokyo), 1994, 2000, 2006
- The Thailand Research Fund's **"Best Research Award 1999"** on Plaunotol biosynthetic studies in *Croton sublyratus* (US patent no. 5, 879, 916, March 9, 1999)
- Thailand's **BIOTEC Research Group Development Grant,** 2003-2008 (20-million Baht Grant)
- Thailand's National Innovation Agency's **"Innovation Ambassador Award 2008"**
- **Technology Licensing** on "Innovative Analysis of Artemisinin in *Artemisia* Leaves" to *Artemisinin and Farming International Company*, February 2009
- **National Research Council of Thailand's Invention Award 2010** on a new analytical technique for determination of artemisinin in *Artemisia* leaves

6. PUBLICATIONS

I. PATENTS

1. De-Eknamkul W. and P. Tansakul. Geranylgeraniol-18-hydroxlase from *Croton sublyratus* **US patent no. 5, 879, 916**, March 9, 1999

2. De-Eknamkul W. and P. Tansakul. Production of an Anti-Peptic Ulcer Plaunotol by an Enzymatic Reaction, **Thai Patent no. 9858**, September 15, 2000

3. Koobkokkruad, T., C. Kerdmanee, W. De-Eknamkul. Development of *Artemisia annua* Strains for y Yield Improvement of Artemisinin by Gamma Irradiation. Submitted for patenting, No. 0901001074, on March 12, 2009, and advertisement on August 2012

II. ORIGINAL RESEARCH ARTICLES

1. Karnsomwan, W., Rungrotmongkol, T., **De-Eknamkul, W.,** Chamni, S. In Silico Structural Prediction of Human Steroid 5α-Reductase Type II, Medicinal Chemistry Research, 25, (6):1049-1056 (2016)

2. Jain R, Monthakantirat O, Tengamnuay P, **De-Eknamkul W**. Identification of a new plant extract for androgenic alopecia treatment using a non-radioactive human hair dermal papilla cell-based assay. Jain et al. BMC Complementary and Alternative
Medicine, 16, (1):18 (2016)

3. Wunnakup T, Vimolmangkang S, **De-Eaknamkul W**. Transient expression of homogentisate prenyltransferase genes from *Clitoria ternatea* Increases α-tocopherol production in transient tomato, ***J. Plant Biochemistry and Biotechnology***, in press.

4. Promden, W., Monthakantirat, O., Umehara, K., Noguchi, H., **De-Eknamkul, W.** Evaluation of Mushroom Tyrosinase as a Reliable Screening Target for Inhibitors of Mammalian Tyrosinase and Melanin Synthesis in Melanocytes. Molecules, submitted

5. Sintupachee S, Promden W, Ngamrojanavanich N, Sitthithaworn W, **De-Eknamkul W.** 2015. Functional expression of a putative geraniol 8-hydroxylase by reconstitution of bacterially expressed plant CYP76F45 and NADPH-cytochrome P450 reductase CPR I from Croton stellatopilosus Ohba. Phytochemistry. 118:204-215 (2015)

6. Sintupacheea, S., Ngamrojanavanich, N., Sitthithaworn, W., **De-Eknamkul, W.** Molecular cloning, bacterial expression and functional characterisation of cytochrome P450 monooxygenase, CYP97C27, and NADPH-cytochrome P450 reductase, CPR I, from *Croton stellatopilosus* Ohba, Plant Science, 229, 131–141 (2014)

7. Jain, R., **De-Eknamkul, W.** Potential Targets in the Discovery of New Hair-Growth Promoters for *Androgenic Alopecia*, Expert Opinion on Therapeutic Targets, 18, 787–806 (2014)

8. Jain, R., Monthakantirat, O., Tengamnuay, P., **De-Eknamkul, W.** Avicequnione C isolated from Avicennia marina exhibits 5α-reductase-type 1 inhibitory activity using androgenic alopecia relevant cell-based assay system, Molecules, 19, 6809-6821 (2014)

9. Promden, W., Monthakantirat, O., Umehara, K., Noguchi, H., **De-Eknamkul, W.** Structure and Antioxidant Activity Relationships of Isoflavonoids from Dalbergia parviflora. Molecules, 19, 2226-2237 (2014)

10. Chaotham, C., Chivapat, S., Chaikitwattana, A., **De-Eknamkul, W.** Acute and Chronic Oral Toxicity of a Partially-Purified Plaunotol Extract from Croton stellatopilosus Ohba, Biomedical Research International, Article ID 303162, 1-12 (2013)

11. Kongduang, D., **De-Eknamkul, W.**, Sitthithaworn, W., Wungsintaweekul, J. Terpenoid content and transcription profile analysis in callus and suspension cultures of Croton stellatopilosus, Journal of Plant Biochemistry And Biotechnology, 23, 61–68 (2014)

12. Chamni, S., and **De-Eknamkul, W.** Recent progress and challenges in the discovery of new neuraminidase inhibitors, Expert Opin. Ther. Patents. 23, 409-423 (2013)

13. Chaotham, C., **De-Eknamkul, W.**, Chanvorachote, P. Protective effect of plaunotol against doxorubicin-induced renal cell death J. Nat. Med. 67, 311-319 (2013)

14. Nualkaew, N., Guennewich, N., Springob, K., Klamrak, A., **De-Eknamkul, W.**, Kutchan, T. Molecular Cloning and Catalytic Activity of a Membrane-Bound Prenyl Diphosphate Phosphatase from Croton stellatopilosus Ohba, *Phytochemistry*. 91, 140-148 (2013)

15. Chaotham, C., **De-Eknamkul, W.**, Chanvorachote, P. Protective effect of plaunotol against doxorubicin-induced renal cell death. DOI: 10.1007/s11418-012-0683-6 (2012)

16. Maneechai S, **De-Eknamkul W.**, Umehara K, Noguchi H, Likhitwitayawuid K. Flavonoid and stilbenoid production in callus cultures of *Artocarpus lakoocha* 81, 42- 49 (2012)

17. Kongkamnerd, J. , Cappelletti, L., Prandi, A., Seneci, P., Rungrotmongkol, T., Jongaroonngamsang, N., Rojsitthisak, P., Frecer, V., Milani, A., Cattoli, G., Terregino, C., Capua, I., Beneduce, L., Gallotta, A., Pengo, P., Fassina, G., Miertus, S., **De-Eknamkul, W.** Synthesis and in vitro study of novel neuraminidase inhibitors against avian influenza virus. 20, 2152-2157 (2012)

18. Kongkamnerd, J., Milani, A., Cattoli, G., Terregino, C., Ilaria Capua, I., Beneduce, L., Gallotta, A., Pengo, P., Fassina, G., Umehara, K., Miertus, S., **De-Eknamkul, W.** A screening assay for neuraminidase inhibitors using neuraminidases N1 and N3 from a Baculovirus Expression System, *Journal of Enzyme Inhibition and Medicinal Chemistry* 27, 5-11 (2012*)*

19. Sakee, U., Maneerat, S., Cushnie, T. P., **De-Eknamkul, W.** Antimicrobial activity of *Blumea balsamifera* (Lin.) DC. extracts and essential oil. 25,1849-1856 (2011)

20. Kongkamnerd, J., Milani, A., Cattoli, G., Terregino, C., Capua, I., Beneduce, L., Gallotta, A., Pengo, P., Fassina, G., Umehara, K., **De-Eknamkul, W.**, Miertus, S. The quenching effect of flavonoids on 4-methylumbelliferone, a potential pitfall in fluorimetric neuraminidase inhibition assays, *Journal of Biomolecular Screening* 16, 755-764 (2011)

21. **De-Eknamkul, W.**, Umehara, K., Monthakantirat, O., Toth, R., Frecer, V., Knapic, L., Braiuca, P., Noguchi, H. and Stanislav Miertus. QSAR Study of natural estrogen-like isoflavonoids and diphenolics from thai medicinal plants, *Journal of Molecular Graphics and Modelling* 29, 784-794 (2011)

22. Naowaratwattana, W., **De-Eknamkul, W.**, and Gonzalez De Mejia, E. Phenolic-containing organic extracts of mulberry (Morus alba L.) leaves inhibit HepG2 hepatoma cells through G2/M phase arrest and inhibition of topoisomerase IIα activity. *Journal of Medicinal Food* 13,1045-1056 (2010)

23. Sucontphunt, A., **De-Eknamkul, W.**, Nimmannit, U., Dimitrijevich, S. D. and Gracy, R. W. Protection of HT22 neuronal cells against glutamate toxicity mediated by antioxidant activity of Pueraria candollei var. mirifica extracts. *Journal of Natural Medicine* 65, 1-8 (2010)

24. Sitthithaworn, W**.**, Wungsintaweekul, J., Sirisuntipong, T., Charoonratana, T., Ebizuka, Y. **De-Eknamkul, W.** Cloning and expression of 1-deoxy-D-xylulose 5-phosphate synthase cDNA from *Croton stellatopilosus* and expression of 2C-methyl-D-erythritol 4-phosphate synthase and 8eranylgeranyl diphosphate synthase, key enzymes of plaunotol biosynthesis. *Journal of Plant Physiology* 167, 292–300 (2010)

25. Vangnai, A. S., Promden, W., **De-Eknamkul, W.**, Matsushita, K., Toyama, H. Molecular characterization and heterologous expression of quinate dehydrogenase gene from *Gluconobacter oxydans* IFO3244. *Biochemistry (Moscow),* 75, 452-459 (2010)

26. Jitsaeng, K., **De-Eknamkul, W.**, Schneider, B. Flavonoids and a new Calamenene-type sesquiterpene from rhizomes of *Alpinia oxymitra* K. Schum. (Zingiberaceae) *Records of Natural Products* 110-111 (2009)

27. Rungrotmongkol, T., Frecer, V., **De-Eknamkul, W.**, Hannongbua, S., Miertus, S. Design of oseltamivir analogs inhibiting neuraminidase of avian influenza virus H5N1. *Antiviral Research* 51-58 (2009)

28. Umehara, K., Nemoto, K., Matsushita, A., Terada, E., Monthakantirat, O., **De- Eknamkul, W.**, Miyase, T., Warashina, T., Degawa, M. and Noguchi, H. Flavonoids from the heartwood of Thai medicinal plant *Dalbergia parviflora* and their effects on estrogenic responsive human breast cancer cells, *Journal of Natural Products* 72 2163- 2168 (2009)

29. Chanama, M., Wunnakup, T., **De-Eknamkul, W.** and Chanama, S. Improvement of Thin Layer Chromatography for Enzyme Assay of Geranylgeraniol-18-Hydroxylase from *Croton stellatopilosus* Ohba. *Journal of Planar Chromatography* 22, 49-53 (2009)

30. Rinthong, T., Jindaprasert, A., and **De-Eknamkul W**. Simple Densitometric TLC Analysis of Plaunotol for Screening of High-Plaunotol-Containing Plants of *Croton stellatopilosus* Ohba *Journal of Planar Chromatography* 22, 55-58 (2009)

31. Umehara, K., Kimijima, K., Matsushita, A., Terada, E., Monthakantirat, O., **De-Eknamkul, W**., Miyase, T., Warashina, T., Noguchi, H. Estrogenic constituents of the heartwood of *Dalbrgia paruiflora*, *Phytochemistry*, 69, 546–552 (2008) **(5-Year Impact Factor: 3.278)**

32. Koobkokkruad, T., Chochai, A., Kermanee, C., **De-Eknamkul, W.** Effects of low-dose gamma-irradiationon artemisinin content and amorpha-4,11-diene synthase activity in *Artemisia annua*. *International Journal of Radiation Biology* 84, 878-884 (2008).

33. Lualon, W., **De-Eknamkul, W.,** Tanaka, H, Shoyama Y. and Putalun W. Multiple Shoot regeneration and artemisinin production in *Artemisia annua* L. using Thidiazuron. *Zeitschrift for Naturforschung*, 63 C, 96-100 (2008).

34. Jindaprasert A., Springob, K., Schmidt, J., **De-Eknamkul, W.,** Kutchan, T.M. Pyrone polyketides synthesized by a Type III Polyketide Synthase from *Drosophyllum lusitanicum*, *Phytochemistry*, 69, 3043–3053 (2008) **(5-Year Impact Factor: 3.278)**

35. Wungsintaweekul, J., Sirisuntipong, T., Kongduang, D., Losuphanporn, T., Ounaroon, A., Tansakul, P. and **De-Eknamkul, W.** Transcription profiles of genes encoding 1-deoxy-D-xylulose-5-phosphate synthase and 2*C*-methyl-D-erythritol-4-phosphate synthase in plaunotol biosynthesis from *Croton stellatopilosus*. ***Biol. Pharm. Bull.*** 31, 852-856 (2008).

36. Kongduang, D., Wungsintaweekul, J. and **De-Eknamkul, W.** Biosynthesis of β-Sitosterol and Stigmasterol proceeds exclusively via the mevalonate pathway in cell suspension cultures of *Croton stellatopilosus*. *Tetrahedron Lett*ers. 49, 4067-4072 (2008).

37. Wiwat Lamoolphak. **De-Eknamkul, W.,** Artiwan Shotipruk. Hydrothermal production and characterization of protein and amino acids from silk waste, *BioresourceTechnology*, 99**,** 7678-7685 (2008)

38. Chattip Prommuak, **De-Eknamkul, W**., Artiwan Shotipruk. Extraction of flavonoids and carotenoids from Thai silk waste and antioxidant activity of extracts. *Separation and Purification Technology*, 62, 445–449 (2008).

39. Koobkokkruad, T., Chochai, A., Kerdmanee, C., and **De-Eknamkul, W.** TLC-Densitometric analysis of artemisinin for rapid screening of high producing plantlets of *Artemisia annua* L. *Phytochemical Analysis*, 229-234 (2007).

40. Wungsintaweekul, J., Sriyapai, C., Kaewkerd, Sanlaya, Tewtrakul, S., Kongduang, D., **De-Eknamkul, W.** Establishment of *Croton Stellatopilosus* suspension culture for geranylgeraniol production and diterpenoid biosynthesis. *Zeitschrift for Naturforschung*, 62C, 389-396 (2007).

41. Putalun, W., Luealon, W., **De-Eknamkul, W.**, Tanaka, H. and Shoyama, Y. Improvement of artemisinin production by chitosan in hairy root Cultures of *Artemisia annua* L. *Biotechnology Letters*, 29 : 1143-1146 (2007).

42. Springob, K., Samappito, S., Jindaprasert, A., Schmidt, J., Page, J.E., **De-Eknamkul, W.** and Kutchan, T.M. A polyketide synthase of *Plumbago indica* that catalyzes the formation of a hexaketide pyrones. *FEBS Journal*, 274, 406-417 (2007).

43. Putalun, W., **De-Eknamkul, W.**, Matangkasombut, O., Tanaka, H., Shoyama, Y. Preparation of a novel monoclonal antibody against the antimalarial drugs artemisinin and artesunate. *Planta Medica*. 73, 1127-1132 (2007)

44. Sitthithaworn, W., Potduang, B., and **De-Eknamkul, W.** Localization of plaunotol in the leaf of *Croton stellatopilosus* Ohba. *Science Asia*. 32, 17-20 (2006).

45. Nualkaew, N., **De-Eknamkul, W.,** Kutchan, T.M., and Zenk, M.H. Membrane-Bound geranylgeranyl Diphosphate Phosphatases : Purification and characterization from *Croton Stellatopilosus* leaves. *Phytochemistry*. 67, 1613-1620 (2006) **(5-Year Impact Factor: 3.278)**

46. Putalun, W., Pimmeuangkao, S., **De-Eknamkul, W.**, Tanaka, H., Shoyama, Y. Sennosides A and B production by hairy roots of Senna alata (L.) Roxyb. *Zeitschrift for Naturforschung*, 61C, 367-371 (2006).

47. Wungsintaweekul, J. and **De-Eknamkul, W.** Biosynthesis of plaunotol in *Croton stellatopilosus* proceeds via the deoxyxylulose phosphate pathway. *Tetrahedron Letters,* 46, 2125-2128 (2005).

48. Monthakantirat, O., **De-Eknamkul, W**., Umehara, K., Yoshinaga, Y. Miyase, T., Warashina, T. and Noguchi, H. Phenolic constituents of the rhizomes of the Thai medicinal plant *Belamcanda chinensis* with proliferative activity for two breast cancer cell lines. *Journal of Natural Products*. 68, 361-364 (2005).

49. Nualkaew N., **De-Eknamkul W.**, Kutchan T.M., and Zenk M.H. Geranylgeraniol Formation in *Croton stellapilosus* proceeds via successive monodephosphorylations of geranylgeranyl diphosphate. *Tetrahedron Letters.* 46, 8727-8731 (2005)

50. **De-Eknamkul, W.** and B. Potduang. Biosynthesis of beta -sitosterol and stigmasterol in *Croton sublyratus* proceeds via a mixed origin of isoprene units. *Phytochemistry*, 62, 389-398 (2003). **(5-Year Impact Factor: 3.278)**

51. Samappito, S., J.E. Page, Jurgen S., **W. De-Eknamkul** and T.M. Kutchan. Aromatic and pyrone polyketides synthesized by a stilbene synthase from *Rheum tataricum*. *Phytochemistry*, 62, 313-323 (2003). **(5-Year Impact Factor: 3.278)**

52. Samappito, S., J.E. Page, Jurgen S., **W. De-Eknamkul** and T.M. Kutchan. Molecular characterization of root-specific chalocone synthases from *Cassia alata*. *Planta,* 216, 64-71 (2002).

53. **De-Eknamkul, W.** and C. Thongruang. Possibility of Pueraria mirifica to affect breast enlargement. *J. Pharm. Sci.*, 25, 1-9 (2001).

54. **De-Eknamkul, W.**, N. Suttipanta and T.M. Kutchan. Purification and characterization of deacetylipecoside synthase from *Alangium lamarckii.* *Phytochemistry*, 55, 177-181 (2000). **(5-Year Impact Factor: 3.278)**

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56. **De-Eknamkul, W.** Chasing the key enzymes of secondary-metabolite biosynthesis from Thai medicinal plants. *Pure and Applied Chemistry* 70, 2107-2145 (1998).

57. Vongchareonsathit, A. and **De-Eknamkul, W.** Rapid TLC-densitometric Analysis of Plaunotol from *Croton sublyratus*. *Planta Medica,* 64, 279-280 (1998).

58. Tansakul, P. and **De-Eknamkul, W.** Geranylgeraniol-18-hydroxylase : The last enzyme on the plaunotol biosynthetic pathway in *Croton sublyratus*. *Phytochemistry*, 47: 1241-1246 (1998).

59. **De-Eknamkul, W.**, A., Ounaroon, T., Tanahashi, T.M. Kutchan, and M.H. Zenk, Enzymatic condensation of dopamine and secologanin by *Alangium lamarckii*. *Phytochemistry*, 45, 477-484 (1997).

60. Panichayupakaranant, P., H. Noguchi, **W. De-Eknamkul** and U. Sankawa. Naphthoquinones and coumarins from root cultures of *Impatiens balsamina*. *Phytochemistry*, 40, 1141-1143, (1995).

61. Nualbunruang, P., **W. De-Eknamkul** and S. Panichajakul. Plant Regeneration from Callus of Soybean (*Glycine max* L.) *J. Agricult.* 28, 512-517 (1994).

62. Kamerer, L., **W. De-Eknamkul** and M.H. Zenk. Enzymic 12-hydroxylation and 12-O-methylation of dihydrochelirubine in dihydromacarpine formation by *Thalictrum bulgaricum*. *Phytochemistry*, 36, 1409-1416, (1994).

63. Panichayupakaranant, P. and **W. De-Eknamkul.** Enzymic methylation of lawsone to form 2-methoxy-1,4-naphthoquinone in *Impatiens balsamina* leaves. *Thai J. Pharm. Sci.*, 16, 287-289, (1992).

64. Tewtrakul, S., **W. De-Eknamkul** and N. Ruangrungsi. Simultaneous determination of individual curcuminoids in turmeric by TLC-densitometric method. *Thai J. Pharm. Sci.*, 16, 251-259, (1992).

65. **De-Eknamkul, W**., T. Tanahashi, and M.H. Zenk. Enzymic 10-hydroxylation and 10-O-methylation of dihydrosanguinarine in dihydrochelirubine formation by *Eschscholizia.* *Phytochemistry*, 31, 2713-2717, (1992).

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68. Panichayupakaranant, P. and **W. De-Eknamkul**. Study on naphthoquinone formation in invitro cultures of *Impatiens balsamina* L. *Thai J. Pharm. Sci*., 16, 29-37 (1992).

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72. **De-Eknamkul, W.**, and B.E. Ellis. Purification and characterization of tyrosine aminotransferase activities from *Anchusa officinalis* cell cultures. *Arch. Biochem. Biophys.*, 257, 430-438, (1987).

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74. **De-Eknamkul, W.**, and B.E. Ellis. Effects of auxins and cytokinins on growth and rosmarinic acid formation in cell suspension cultures of *Anchusa officinalis*. *Plant Cell Reports*, 4, 50-53, (1985).

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