

fed with DON-free diet at same time. Voluntary feed intake for 21 days and consequently, DON caused obvious damages to piglets of toxic group. However, clinic parameters, like intestinal morphology, the amino acids concentrations in the serum, jejunum and ileum were notably ($P < 0.05$) improved by the supplementary Arg. Furthermore, the mRNA levels of $\gamma + L$ amino acid transporter 1, cationic amino acid transporter, excitatory amino acid carrier type 1 that down-regulated in the jejunum of toxic group increased ($P < 0.05$) in the Arg group. In conclusion, Arg plays a protective role in the small intestine to alleviate the adverse effects of DON.

Keywords: Deoxynivalenol, Arginine, Intestinal function, Amino Acids transporter.

Biology-oriented diverted synthesis of glutamate analogs

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Ionotropic glutamate receptors (iGluRs) play a pivotal role in higher brain functions such as learning and memory by mediating the majority of fast excitatory neurotransmission in the mammalian central nervous system. iGluR is also thought to be fully or partly involved in nociception and closely related to brain disorders such as Alzheimer and Parkinson diseases. Structurally, iGluR is composed of four subunits assembling as homomers or heteromers to form the ionchannel. The neurotransmitter, such as glutamic acid, generally binds to the ligand-binding domain (LBD) of iGluR and causes structural change of the transmembrane domain. It has been of particular interest to develop selective and specific ligands for iGluR as a drug candidate to treat neuronal diseases mentioned above, and many modulators have been reported and investigated for clinical trials. In 2008, we synthetically constructed compound collection of artificial glutamate analogs which are structurally inspired by excitatory amino acids such as dysiherbaine and kainic acid. In vitro and in vivo evaluations have identified some biologically interesting compounds including IKM-159. IKM-159 weakly inhibits AMPA-type iGluR with some selectivity to GluA2 and GluA4 subunit proteins. Structural study of the complex indicated the unique interactions with GluA2 LBD. To develop more potent and/or selective modulators for iGluRs, we further studied diverted synthesis of IKM-159 analogs. Here we report our recent progress on these synthetic studies.

Synthesis of C-terminal octapeptide B₂₃₋₃₀ of B-chain human insulin by classical peptide method to be used in semisynthesis of human insulin iodinated at tyrosine B₁₆

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C-Terminal protected octapeptide B₂₃₋₃₀ of the B-chain human insulin (benzyloxycarbonyl-glycyl-phenylalanyl-phenylalanyl-*O*-t-butyltyrosyl-*O*-t-butyl-threonyl-prolyl-*N*-methylsulphonylethoxy-carbonyllyzyl-*O*-t-butylthreonyl-t-butyl ester) was synthesized by the stepwise peptide synthesis, using DCC and 1-hydroxybenzotriazole as a condensing agent for fragment condensation of B₂₉-B₃₀ with B₂₇-B₂₈ dipeptides and B₂₃-B₂₆ with B₂₇-B₃₀. Cleavage of benzyloxy-carbonyl groups from N-terminal and coupling with DOP B₁-B₂₂, iodinated at Tyrosine B₁₆ and then combined to natural A-chain giving Human insulin iodinated at Tyrosine B₁₆ selectively.

Keywords: Peptide synthesis, Human insulin, Iodinated tyrosine, N-Methyl sulphonyl ethloxycarbonyl, DOP B-chain.

Icosahedral chart of the 20 commonly occurring amino acids

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The 20 commonly occurring amino acids are Alanine, Arginine, Asparagine, Aspartic Acid, Cysteine, Glutamine, Glutamic Acid, Glycine, Histidine, Isoleucine, Leucine, Lysine, Methionine, Phenylalanine, Proline, Serine, Threonine, Tryptophan, Tyrosine, and Valine. The corresponding 3-letter symbols of the amino acids are Ala, Arg, Asn, Asp, Cys, Gln, Glu, Gly, His, Ile, Leu, Lys, Met, Phe, Pro, Ser, Thr, Trp, Tyr, and Val. The corresponding 1-letter symbols of the amino acids are: A, R, N, D, C, Q, E, G, H, I, L, K, M, F, P, S, T, W, Y, and V. A Platonic polyhedron is a polyhedron with congruent faces and the same number of faces meeting at each vertex. The 5 Platonic polyhedrons are the Tetrahedron with 4 faces, the Cube with 6 faces, the Octahedron with 8 faces, the Dodecahedron with 12 faces, and the Icosahedron with 20 faces. Since there are 20 commonly occurring amino acids and there are 20 faces to an icosahedron, a useful heuristic device for learning and remembering the chemical structures, the names, the 3-letter symbols, and the 1-letter symbols of the amino acids can be constructed by placing the chemical structure, the 3-letter symbol, and the 1-letter symbol for each amino acid on a single face of an icosahedron. The United States Design Patent Number US D721,005 S, by the author, entitled ICOSAHEDRAL CHART OF THE 20 COMMONLY OCCURRING AMINO ACIDS shows what such an icosahedron with the chemical structure, 3-letter symbol, and 1-letter symbol, for each amino acid on each face of such an icosahedron would look like from front, right, left, top, and bottom views. Design Patent US D721,005 S also contains two cut-and-assemble half-patterns which can be cut out and assembled to make the icosahedron shown in the design patent. Once the icosahedron is assembled, it can be tossed at random like a 20-sided dice to generate random amino acid sequences. For example, one such random amino acid sequence that is 100 amino acids long, which was generated by randomly tossing the icosahedron is KWLLEKSTPSEKWIEDGRTVCLFMPHAMNHKGRESYCGYCY NIMTSKETRECCGGKNPQARDKGGKNNMCHFSLCRWYQSMNH HWNGIRFREERGVGED.

Limitation of proteolysis in soils of forests and other types of ecosystems by diffusion of substrate

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Proteinaceous materials are hypothesised to represent approximately 40 % of total nitrogen in soils. Proteolytic enzymes depolymerize proteins into amino acids that serve as a source of carbon and nitrogen