<table>
<thead>
<tr>
<th>Title</th>
<th>24R, 25-Dihydroxyvitamin D_3 : a vitamin D_3 metabolite essential for the healing process of a fracture and the evidence for its membrane receptor in fracture healing tissue</th>
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<td>Author(s)</td>
<td>KATO, Akira</td>
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INFORMATION

Hokkaido University conferred the degree of Doctor of Philosophy (Ph. D) in Veterinary Medicine on September 25, 1998 to 2 recipients and December 25, 1998 to 2 recipients.
The titles of their theses and other information are as follows:

24R, 25-Dihydroxyvitamin D₃: a vitamin D₃ metabolite essential for the healing process of a fracture and the evidence for its membrane receptor in fracture healing tissue

Akira Kato
Clinical Investigation Department, Kureha Chemical Industry, Co., Ltd.
1-9-11 Nihonbashi Horigome-cho, Chuo-ku, Tokyo, 103-8552, Japan
ceptor for $1\alpha, 25(\text{OH})_2\text{D}_3$ is known to be present in osteoblast and absent in osteoclast cell lines, no systematic study has been carried out on the callus tissue which is formed during fracture-healing. Therefore I investigated a $1\alpha, 25(\text{OH})_2\text{D}_3$ receptor/binding protein for all callus fractions: nuclear, postnuclear membrane, and high speed cytosol fraction of the callus tissue of a tibial fracture. The binding of $1\alpha, 25(\text{OH})_2\text{D}_3$ observed in the nuclear fraction was not saturable. Saturable binding was observed in the callus membrane and the cytosol fractions where the $K_D/B_{\text{max}}$ values were $0.83 \pm 0.35 \text{nM}/35.8 \pm 5.28 \text{fmol/mg protein}$ and $0.66 \pm 0.38 \text{nM}/9.8 \pm 1.4 \text{fmol/mg protein}$, respectively. These receptor-ligand kinetics values were clearly different from those of the membrane receptor for $24R, 25(\text{OH})_2\text{D}_3$.

Thus I confirmed the presence of a membrane binding protein for $24R, 25(\text{OH})_2\text{D}_3$, which is distinct from the $1\alpha, 25(\text{OH})_2\text{D}_3$ receptor and also from DBP. This implies that $24R, 25(\text{OH})_2\text{D}_3$ may generate biological responses via a signal transduction pathway(s) separate and distinct from that of $1\alpha, 25(\text{OH})_2\text{D}_3$. Collectively, my results suggest that $24R, 25(\text{OH})_2\text{D}_3$ is a functionally important vitamin D$_3$ metabolite in bone biology and may function to generate biological responses through interaction with the membrane receptor indicated in the present study.


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Environmental Monitoring Using Wildlife as a Biomarker: Inhabiting Environment Differentially Changes P450 Isozyme Specific Activities in Wild Rodents

Hidenobu HOSHI

Institute of Laboratory Animal Research Center,
Toyama Medical and Pharmaceutical University,
2630 Sugitani, Toyama 930-0194, Japan

Summary

In order to estimate the suitability of using accumulation of pollutants in wildlife as an indicator of environmental pollution, I investigated the residue levels of organochlorine compounds (OCs) and their accumulation patterns in 8 species of terrestrial mammals and 10 species of birds. The accumulation of OCs to environment has been of great concern, because of their persistent and less degraded properties.

OCs accumulated in terrestrial mammals and birds were mostly in the order of polychlorinated biphenyls (PCBs) > dichlorodiphenyltrichloroethane compounds (DDTs) > hexachlorocyclohexane isomers (HCHs) > hexachlorobenzene (HCB). The accumulation levels of OCs in terrestrial mammals were lower than those in birds. The contamination levels of OCs were found to be higher in omnivorous mammals than in herbivorous ones, and in fish-eating ones and