

# MINERVA CENTER FOR CALCIUM AND BONE METABOLISM

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## INTRODUCTION

The Minerva Center for Calcium and Bone Metabolism was established in 1992 as a joint Israeli-German venture, to promote research in calcium and bone metabolism. The research at the center is aimed at understanding the molecular mechanisms by which the hormones that control serum calcium and bone strength are regulated. The hormones involved are the parathyroid hormone (PTH) and a vitamin D product. The diseases with major disturbances in the homeostasis of calcium and bone are chronic renal failure and osteoporosis.

We have shown that the vitamin D hormone decreases the production of PTH at the level of gene transcription. In addition, when the serum calcium is low, there is enhanced secretion of PTH, which acts on the bone and kidney to increase the serum calcium. We have also shown how the parathyroid glands increase PTH synthesis, using the tools of molecular biology. In patients with chronic renal failure, the parathyroid glands become very large and produce uncontrolled

amounts of the hormone, in which case PTH is destructive to bone. We are investigating the molecular mechanisms involved in the unregulated production of PTH.

The knowledge that we have acquired and are constantly researching is important to our understanding of osteoporosis, which is relevant to all women after menopause. The ideas generated by our research are used in the treatment of patients with chronic renal failure, and have provided the basis for the development of a novel treatment for osteoporosis.

The research performed in our laboratory has received support from granting agencies such as the NIH, Minerva Foundation, Israel Academy of Sciences, U.S.- Israel Binational Science Foundation, German-Israel Fund, Israel Cancer Research Fund and Israel Cancer Association, as well as industrial support of companies in the U.S.A. and Japan.

**Key Words:** PTH, calcium, phosphate, vitamin D

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