KAROLINSKA INSTITUTET
NOBEL COMMITTEE FOR PHYSIOLOGY OR MEDICINE

STRICTLY CONFIDENTIAL

As members of the Nobel Committee of Karolinska Institutet we have the honour of inviting you to nominate one or more candidates for the

Nobel prize in physiology or medicine for 1978

You will find on the enclosed page excerpts from the Statutes of the Nobel Foundation with comments.

In order to be considered by the Committee your nomination has to be made on the enclosed nomination form. Further nominations may be submitted on photocopies of the nomination form.

In support of your nomination the following documentary information must be included for each candidate:

1. A description of the discovery and the publications showing why the nominee's work qualifies for the award.
2. A bibliography of the most important publications as mentioned in item 1.
3. A short curriculum vitae.

On the nomination form a summary of the description according to item 1 should be given.

To be eligible for consideration for the 1978 Nobel Prize, nominations must be received by the committee before February 1, 1978.

The nomination form with enclosures should be addressed to
The Nobel Committee for Physiology or Medicine,
Karolinska Institutet,
S-104 01 Stockholm 60, Sweden.

Stockholm in September 1977.

NOBEL COMMITTEE FOR PHYSIOLOGY OR MEDICINE

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NOMINATION FOR THE 1978 NOBEL PRIZE IN PHYSIOLOGY OR MEDICINE

Nominations concerning only one discovery or work on a specified subject should be included on each nomination form.

PLEASE TYPE

CANDIDATE (S)

Name — Academic position or title

Address

Name — Academic position or title

Address

Name — Academic position or title

Address

The nomination concerns the discovery of

Summary of the description of the discovery qualifying for the award

Name of nominator: — Academic position or title:

Address:

Signature of Nominator: — Date:

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Professor Robert O. Becker
Dept. of Orthopedic Surgery
State University of New York
Upstate Medical Center
766 Irving Avenue
Syracuse, New York 13210
U.S.A.

NOBELKOMMITTÉN
KAROLINSKA INSTITUTET
S-104 01 STOCKHOLM 60

January 6, 1978

The Nobel Committee for Physiology or Medicine
Karolinska Insitutet
S-104 01 Stockholm 60, Sweden

Gentlemen:

I appreciate the honor offered me by your inviting my nominations for the 1978 Nobel Prize in Physiology and Medicine.

In my area of research interest, there is no one I would consider nominating at this time.

Sincerely,

ROB:tm

Robert O. Becker, M.D.
Research Professor
Department of Orthopedic Surgery

January 12, 1978

Dear Dave;

I think my greatest contribution was the discovery of bioelectric control systems in living organisms and the initial appplication of this concept to clinical medicine. We began this work with the discovery of the electrical factors in limb regeneration as reported in the Journal of Bone and Joint Surgery 43-A, 643-656, 1961: The Bioelectric Factors in Amphibian Limb Regeneration, R.O. Becker. We subsequently were able to show that these electrical currents were at least in part associated with the central nervous system - Nature 196, 675-676, 1962, The Longitudinal Direct Current Gradients of Spinal Nerves, Becker, R.O., Bachman, C.H. and Slaughter, W. Subsequently, you and I worked together in applying these concepts to the initiation and control of fracture healing and discovered not only that similar electrical factors were operative - Clinical Orthopaedics and Related Research 73, 169-198, 1970,-The Electrical Control System Regulating Fracture Healing in Amphibians, Becker, R.O., and Murray, D.G. - but also were able to show that, in this case, the mechanism involved was the electrical induction of cellular dedifferentiation - Transactions of the New York Academy of Sciences 29, 606-615, 1967, A Method for Producing Cellular Dedifferentiation by Means of Very Small Electrical Currents, Becker, R.O. and Murray, D.G. By applying the same concepts, we were able to show that appropriate electrical factors could induce partial limb regeneration in mammals - Bulletin of the New York Academy of Medicine 48, 627-641, 1972, Electrical Stimulation of Partial Limb Regeneration in Mammals, Becker, R.O. and Spadaro, J.A. All of these studies have recently come together in our clinical experiments in which we have demonstrated that very small electrical currents could stimulate new bone growth where desired in the human - Clinical Orthopaedics and Related Research 124, 75-83, 1977, Clinical Experiences with Low Intensity Direct Current Stimulation of Bone Growth, Becker, R.O., Spadaro, J.A. and Marino, A.A.

I have published two papers outlining the known details and implications of the electrical control system which I believe are significant. Annals of the New York Academy of Sciences, 238, 236-241, 1974, The Basic Biological Data Transmission and Control System

Influenced by Electrical Forces, R.O. Becker. Also Bioelectrochem. and Bioenergetics 1, 187-199, 1974, The Significance of Bioelectric Potentials, Becker, R.O. One of the important implications is that the operating characteristics of the system lead to the prediction that exposure of living organisms to electromagnetic fields would produce measurable alterations in physiological functions regulated by the system. Such effects have been discovered - Experientia 32, 565, 1976, The Effect of Continuous Exposure to Low Frequency Electric Fields on Three Generations of Mice: a Pilot Study. Marino, A.A., Becker, R.O. and Ullrich, B. and continuing research has indicated the possibility of an important environmental hazard from man's technological use of this energy.

I think our work on silver ions in the treatment of localized infections may ultimately become important, not only clinically, but also a tool leading to more basic understanding of cell membrane structure and function. However, it has not yet been formally published and has yet to stand the test of time.