The polytrode was placed into the intercellular space of gastrocnemius muscle of a frog and potentials of several adjacent muscle fibers were recorded.

We recorded spreading of excitation in the gastrocnemius muscles during tetanic contraction and during the rest period. It was found that tetanus is accompanied by the rhythmic action potentials that were recorded by all channels of the polytrode. During the rest time a tonic contraction takes place, when single action potentials are observed, enveloping only individual muscle fibers without being distributed to the neighboring fibers. Such contractions were recorded as a series of potentials at individual contact sites of the polytrode.

After recording the action potentials of skeletal muscle we have placed the polytrode into the cardiac muscle tissue. The peculiarity of the heart is a solitary contraction when short potential covers sequentially all fibers and it was recorded on the all the channels simultaneously as one solid "wave".

Conclusion: Our research shows that the excitation of skeletal muscle demonstrated individual potentials from individual muscle fibers. It looks very similar to a myogram of skeletal muscle during the titanic contraction. In the cardiac muscle due to the peculiarities of its structure and ability to transfer the action potential from one cardiomyocyte to another the oscillogram looks like summation of excitations of individual fibers with a very small interval.

Key words: muscle excitation, tetanic contraction, skeletal muscle, cardiac muscle, frog.

COUPLED SPIKE ACTIVITY IN MICROPOPULATIONS OF THE CORTEX NEURONS

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Introduction: As it is known, in many CNS structures, neurons, which are spatially close to each other, form micropopulations. These neurons are characterized not only by neighboring spatial localization but also by the existence of close functional synaptic connections between members of such population. The phenomenon of association of cortical neurons in the so-called columns or rather similar groupings (barrels, etc.) is widely known. But the functional relations between members of such micro populations remain little studied. In our research we recorded rigid coupling of the impulse activity generated by two spatially close cortical neurons that were observed in many cases.

Methods and Results: Using eight-channel metal microelectrodes (diameter of a separate channel 12 μm), we extracellularly recorded the impulse activity of 186 single neurons or their small groups (usually, pairs) localized in the motor cortex of rats anesthetized with ketamine. In 60 cases (32.3%), APs (action potentials) of two single neurons were generated in a parallel manner and demonstrated fixed time relations between each other. This is interpreted as being a result of excitation of two neighboring functionally connected (coupled) cells. These AP pairs could be recorded via one and the same or two neighboring microelectrode channels. Second AP in the pair was elicited exclusively in the case where an AP was preliminarily generated by another neuron, while APs of the latter in some cases could arrive independently. Therefore, "leading" and "accompanying" cells could be identified in such neuronal pairs. The coupling coefficient in the generation of APs by an accompanying unit with respect to APs generated by a leading cell was close to 100%, without dependence on the discharge frequency in the latter. Intervals between APs of two neurons in different coupled pairs varied from about 1.0 to 22-23 msec.

In the case of minimum values of these interspike intervals, APs generated by coupled neurons overlapped each other; this resulted in the formation of spikes looking like "complex APs." Within some time intervals, interspike intervals could increase, and such APs began to be decomposed.

Conclusion: The above-described data are considered the electrophysiological proof of the existence of tight functional coupling between a significant part of cortical neurons spatially close to each other, i.e., members of a micro population, which was obtained in an *in vivo* experiment.

Keywords: multichannel microelectrode recording, motor cortex of mammals, neuronal micropopulations.

SKIN AGING

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Similar to entire organism, skin aging is the imminent intrinsic process, this being also caused by exogen factors. Skin aging and photoaging are especially caused by the ultraviolet radiations, this being the main reason of skin transformation in sun exposed areas.

Despite morphological and pathophysiological differences , the intrinsic and extrinsic skin aging share several similarities on molecular level.

Primary skin aging aspects are defined by the formation of oxygen reactive species and the induction matrix of metalloproteinases. The accumulation of fragmented collagen fibrils prevents neocollagenoses and causes the deterioration of extracellular matrix through positive feedback methods.

The importance of the extrinsic skin aging initiated the development of several preventive therapeutic methods.

BIOCHEMICAL STUDY OF NASAL SECRETIONS IN CHRONIC HYPERTROPHIC RHINITIS

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Introduction: Chronic hypertrophic rhinitis (CHR) affects the air passage by the respiratory lane of the nasal fossae, making the act of respiration harder and reducing considerably the life's quality of the patients (about 16-50% of the population suffer from CHR).

Morphologically, the hypertrophy of all the nasal turbinate layers occurs including the glands and nasal mucosa.

Nowadays, the diagnosis of CHR is made on clinical examination and patient's anamnesis. However, the pathogenetic mechanisms of this disease induce important changes at the cellular and biochemical levels, undetectable in its prodromal period and which anticipates the clinical manifestations. Exactly these primary alterations are the trigger, on which the further evolution of the disease will depend.