TRANSFER OF INFORMATION FROM MOLECULES BY MEANS OF ELECTRONIC AMPLIFICATION - PRELIMINARY RESULTS

M. Citro, C.W. Smith, A. Scott-Morley, W. Pongratz, P.C. Endler

SUMMARY

In the present study, it was attempted to transfer information from a molecular thyroxine suspension ($1:10^3$) to non-pretreated distilled water ("test liquid") by means of an electronic amplifier. Two transitions in the metamorphosis of Rana temporaria were investigated under the influence of this test liquid.

Interestingly, in these preliminary experiments, the test liquid, after an initial acceleration period, slowed down both the development from the two-legged to the four-legged tadpole as well as to the juvenile frog.

ZUSAMMENFASSUNG

In der vorliegenden Studie wurde versucht, mittels eines elektronischen Verstärkers Information von einer molekularen Thyroxin-Suspension ($1:10^3$) auf nicht vorbehandeltes destilliertes Wasser zu übertragen (= "Testflüssigkeit"). Unter dem Einfluß dieser Testflüssigkeit wurden zwei Übergänge in der Metamorphose von Rana temporaria untersucht.

Interessanterweise verlangsamte die Testflüssigkeit in diesen vorläufigen Experimenten nach einer anfänglichen Beschleunigungs-Phase sowohl die Entwicklung von der zweibeinigen zur vierbeinigen Kaulquappe als auch zum juvenilen Frosch.

INTRODUCTION

Biological effects of substances in ultra-high dilution (UHD) have been reported, where, theoretically, no original molecule can be present (see the respective contributions in this volume). Our experimental model is based on the fact that the hormone thyroxine plays an important steering role in the metamorphosis of amphibia (for details, see the contribution by Endler et al.). It was shown that the metamorphosis of these animals can be influenced by an UHD of thyroxine ($1:10^{30}$) in two typical ways: depending on the frequency of application, either an inhibitory or an accelerating effect was achieved. This led to the idea that information from the original thyroxine molecules was transduced to the diluent (water) during the dilution process (for theoretical - quantum mechanical - explanations of this information transfer see Berezin's, Del Giudice's, Schulte's and Smith's contributions).

In order to learn more about the nature of the information transduced from the molecule to the dilutent water, we performed experiments in which the UHD was not mixed with the water of the aquarium containing the animals. For this purpose it was applicated in a closed vial that was hung into the water basin and remained there during the course of the experiment. Here, too, comparable, statistically highly significant effects on the metamorphosis of the amphibia were found (see the contribution by Endler et al.).

The study described above and related studies (see the contribution by Pongratz et al. and the contribution by van Wijk et al.) led to the speculation that electromagnetic (or magnetic vector potential, see Smith's contribution) fields may play a decisive role in the information transfer from the UHD to the living system (see Popp's, Benveniste's and Smith's contributions and the Prospects on Elements of a Theory on UHDs).

P.C. Endler and J. Schulte (eds.), Ultra High Dilution, 209–214.

Our question was whether or not field phenomena also play a role in the information transfer from diluted molecules to the UHD, i.e., whether or not electromagnetic fields are linked to molecules (Fröhlich 1983, 1986a,b; see Benveniste's and Smith's contributions). In order to investigate this question, sealed vials of molecular thyroxine solution and of water for control, respectively, were placed in a coil connected with the input of a specially designed amplifier. Sealed water vials were placed in the output coil; the water of these vials was used to treat the amphibian larves with.

The method of using an electromagnetic device in order to transfer low energy information from UHDs was developed by Rasche (Morell 1990) with regard to information from UHDs (see also Smith's contribution). Moreover, the technique of transferring information directly from molecular substances was developed by Citro (Citro 1991). After preliminary experiments with an immunological model in the laboratory of J. Benveniste (Citro 1993), and a botanical model in the laboratory of F.-A. Popp (Citro 1993), the following experiments were performed.

METHODS

Animals: For the experiments, Austrian Rana temporaria from a site 400 m above sea level were taken. For this population, metamorphosis proceeds in May /June.

Staging: For the experiments we chose only those two-legged tadpoles which had just started to develop their hind legs, comparable to stage 31 according to Gosner's staging table (Gosner, 1960). The tadpoles were monitored until the animals had entered the four-legged stage as described in the contribution of Endler et al. (a). Furthermore, the animals were monitored until they had entered the stage with reduced tail (b).

Laboratories involved: The experiments were performed indoors at a site associated with the Research Site for Low Energy Bio-Information (Austria) by W. Pongratz.

Exposition to probes: 8 ml of the test dilution (thyroxine TFF; called "TFF" according to the original designation "pharmacological frequencial transfer" by Citro, for the method of preparation see below) or 8 ml of control (water TFF), respectively, were added blindly to the corresponding basins (each basin contained 8 l of water), followed by gentle stirring, every 8 hours. The corresponding amount of liquid (8 ml) was always pipetted out of the water basin. The transitions from the two-legged to the four-legged tadpoles and to the juveniles were examined in basins as described in the contribution of Endler et al. containing 8 l of water each. Having reached the stage with reduced tail, the animals were transferred into a natural biotope.

Further conditions: The positions of the basins were rotated in the course of the experiment. Indirect natural light was used. Temperature was kept above 18°C. The tadpoles were fed with cooked greens (lettuce). The experimental design was non-violent.

Preparation of testing solutions: Always 20 ml of an aqueous suspension of thyroxine sodium pentahydrate (Sigma) $1:10^3$ at 20°C were kept in a 30 ml bottle with an optical transmission spectrum starting from about 350 nm; the optical transmission spectrum is limited by the properties of the water to wavelengths less than about 2500 nm. This bottle was first agitated 30 times by pushing the partly filled bottle down at short regular intervals to arrive at an even suspension. The suspension was put in the center of a metal beaker that served as a coil which was connected with a specially designed amplifier (Mora III, Firma Rasche, FRG). A bottle containing 100 ml of water was put in the center of a metal beaker that served as the output coil. This coil (Rasche) included two weak permanent magnets. Further details on the electronic device are given in the respective annotation in the discussion section. Seven seconds of amplification 1:40 were always followed by an interval of 3 seconds during a time of 15 minutes. Then the liquid in the output coil was again submitted to the agitation process described above for the liquid in the input coil. It was called "thyroxine TFF". For the preparation of control, distilled water was prepared in an analogous way ("water TFF"). Several analogously prepared sets of liquids were used. Before adding the TFF-liquids to the basin water, they were agitated for several times once more. Always 8 ml of the basin water (8 l) were replaced by 8 ml of the test liquid thrice a day.

Independent solution coding: The sets for the experiment were coded at the University of Graz by A. Nograsek. All sets were applied blindly.

Data base: Six basins which contained 18 animals each were used. Three basins were used for treatment with liquid thyroxine TFF and 3 with water TFF, respectively.

Evaluation of the data: The cumulative frequencies of four-legged animals (F_a), compared to the cumulative frequencies of two- or three-legged animals were evaluated as a 4-field table by the chi-square test at intervals of eight hours (A). Analogously, the cumulative frequencies of animals with reduced tail (F_b) were evaluated. As the results are preliminary, the P-values are discussed, but not indicated in the Figures.

RESULTS

Experiments were performed with at total of 108 animals. In Fig. 1, the bias in the cumulative frequencies of the four-legged animals F_a between the groups treated with the test liquid and the control liquid, are documented. After an initial phase (I) where the F_a - values for thyroxine TFF - animals are above those for reference, the F_a - values for thyroxine TFF - animals are below those for reference at about 5 - 11% (phase II). Due to the small number of animals in the experiment, this difference could not be proven to be statistically significant. However, it can obviously be discussed as a clear trend.

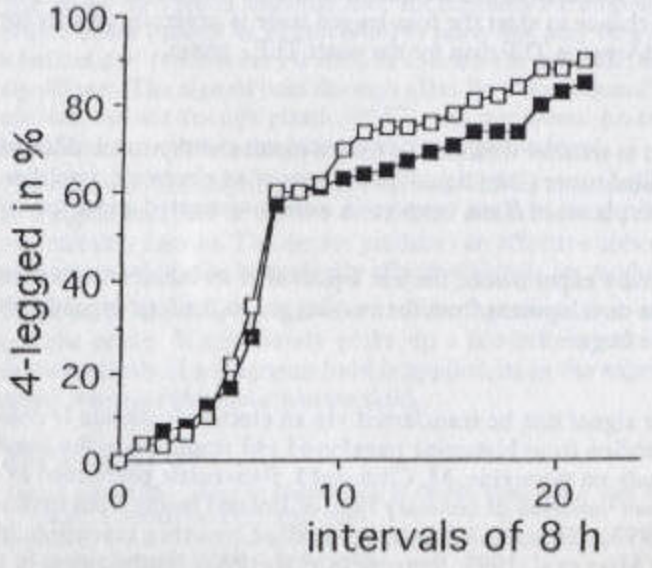

Fig. 1: The influence of the test liquid thyroxine TFF, when added at intervals of 8 hours, on the preclimax metamorphosis of lowland Rana temporaria. Ordinate: above: Cumulative frequencies of four-legged tadpoles in the control group. 100 % refers to 54 animals in the control group. Below: Bias in the cumulative frequencies of four-legged tadpoles between the groups treated with thyroxine TFF and with water TFF, respectively. Abscissa: time at intervals of 8 hours. For further details, see text.

In other words, after an initial increase of the number of animals that have entered the four-legged stage, the overall chance to enter the four-legged stage is generally smaller for the group treated with liquid thyroxine TFF than for the water TFF - group.

In Fig. 2, the bias in the cumulative frequencies of animals with reduced tail F_b is documented. After an initial phase (I) where the F_b - values for thyroxine TFF - animals are above those for reference , the F_b - values for thyroxine TFF - animals are below those for reference at about 5 - 28% (phase II). This difference could be proven to be statistically significant ($P < 0.001$) at the 10th interval.

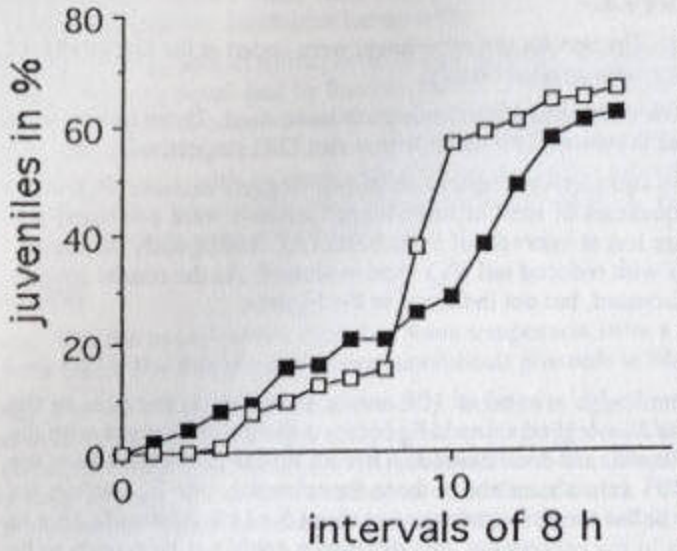

Fig. 2: The influence of the test liquid thyroxine TFF, when added at intervals of 8 hours, on the transition to the animal with reduced tail. Ordinate: above: Cumulative frequencies of animals with reduced tail in the control group. 100 % refers to 54 animals in the control group. Below: Bias in the cumulative frequencies of animals with reduced tail between the groups treated with thyroxine TFF and with water TFF, respectively. For further details, see Fig. 1 and text.

In other words, after an initial increase of the number of animals that have entered the four-legged stage, the overall chance to enter the four-legged stage is generally smaller for the group treated with liquid thyroxine TFF than for the water TFF - group.

DISCUSSION

In this study, it was attempted to transfer information from a molecular thyroxine dilution ($1:10^3$) to non-pretreated distilled water ("test liquid") by means of an electronic amplifier. Two transitions in the metamorphosis of Rana temporaria were investigated under the influence of the test liquid.

Interestingly, in these preliminary experiments, the test liquid, after an initial acceleration period, slowed down both the development from the two-legged to the four-legged tadpoles as well as to the juvenile frogs.

The development of the idea

The finding that a molecular signal can be transferred via an electronic device is consistent with a study on information from histamine transferred and amplified in the same way as is described in our study on thyroxine. M. Citro and J. Benveniste performed experiments showing a significant variation of coronary flow of isolated hearts from immunized guinea-pigs (Citro 1993). This work has been verified by other scientists in Benveniste's working group (Aissa et al. 1993; Benveniste et al. 1993). Furthermore, in a study by Citro and F.A.Popp, it was shown that electrically transferred information from a cytotoxic poison (atracine) is able to influence unicellular organisms (Citro 1993).

Analogue effects in human medical therapy, observed e.g. in a study on drug-dependent patients, as well as in veterinary therapy have been reported by Citro and colleagues (Citro 1991, 1992a,b, 1993). These findings are able to support the idea that electromagnetic (or magnetic vector potential) fields may play a decisive role in the information transfer from biomolecules to the organism (Citro et al. 1993, see Prospects, p. 245ff. For further discussion, see Fröhlich 1983, 1986 a,b; Smith 1989; Smith's and Benveniste's contribution in this volume).

It goes without saying that the findings discussed here have to be repeated thoroughly and that further experiments have to be performed.

The electronic transfer and amplification

According to A. Scott-Morley, a specially designed amplifier (Mora III, Rasche, FRG), in this context, means that one of the "electroacupuncture" devices was used. Such instruments are, in principle, standard electronic amplifiers. If the instrument is operated whilst connected to the electrical mains there is some amplification and transmission of the 50 Hz frequency. However, the instrument is designed to be run from a re-chargeable battery. If operated only from the battery then the d.c. current only is used. It should be noted that even when the instrument is connected to the electrical mains this is only for purposes of re-charging the battery. The output signal still comes from the battery and hence is still d.c. The amplification of the 50 Hz is because of internal rectification of stray signals.

Work conducted at the laboratory of C.W. Smith (using a Bicom device, Brügemann, FRG) shows that the nature of this bio-information signal is a "propagating coherence" and not a "circulating current": hence, only a single lead is used to connect the sample to the amplifier. Such signal, surprisingly, is also amplified by ordinary transistors, the n-p-n bipolar or n-channel FET being effective; the p-n-p and p-channel do not propagate the signal. From this it is concluded that the signal is one of electron coherence, not hole coherence since holes do not propagate it.

The above mentioned antennae used for coupling the ampoules may be a solid beaker or a drilled block (matrix or honeycomb) of brass that may be gold-plated, or of aluminium. If a helical coil (spin-tester) is used to contain the ampoule, the direction of the winding is significant. The signals pass through glass from the internal liquid to the external metallic contact, but not through plastic (PVC) wire insulation. An ordinary banana plug and insulated lead can connect the antenna to the amplifier input.

The nature of the amplifier output viewed with an oscilloscope seems to be noise. The use of a signal analyzer or narrow-band filter can retrieve a coherent signal, but problems of repeatability remain. The device produces an effective coherent carrier with a wavelength of 6 cm on which the biologically effective signals are modulated.

The output antenna is equivalent to the input one, but with the signal passing in the reverse sense. Water slowly picks up a bio-information from a coil or antenna, but instantanously if a magnetic field is applied, as in the experiment discussed here, or if a shock wave is introduced (succussion).

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