

Sexualbiological PET-MRI Research Aimed at Giving the Functional-molecular Map of the Hypothalamus – from Bioethics to Neurochemistry

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Abstract: This will be the first molecular biological investigation into homosexuality in which the hypothesis is based on scientific evidence. Homosexuality will be researched among physiological circumstances, the consequences being of humanistic and psychological nature. It has never happened in the essentialistic investigation into homosexuality, although it is realistic and can be done.

Keywords: sexuality, biopsychology, gender, neurochemistry, hypothalamus

Introduction: General biopsychological approach of the topic – genetic research, adaptionist evolutionary psychological model. The human sociobiological, adaptionist model of homosexuality – biology and psychology: or how can we give a description of the topic in humanities and sciences simultaneously?

For a long time, unfortunately, even homosexuals regarded themselves to be the dead-end of biology. Research and theoretical systems of contemporary evolution science of 1978, 1995 and 2000 have come to the conclusion that the above view is mistaken and not true¹.

In as early as 1978, Edward Wilson, father of human sociobiology, suggested that homosexuals make use of their energies (possibly saved in excess owing to the lack of reproduction) in taking care of their collateral relatives as it has been shown by cultural anthropology, in traditional tribal communities, e.g. in Haiti. In 1995, it was scientifically justified that, compared to heterosexual men, homosexuals had a higher level of empathy in a large population (Salais and Fischer, 1995). Cohesion within groups in homosexual populations was also found to be much stronger by Kirkpatrick and Muscarella in 2000 and 2001, respectively. Genetic and statistical research by

¹ Bereczkei Evolúciós pszichológia, Osiris, 2003: 198-203

Camperio-Ciani, 1992² in a large population has revealed that a mother delivering a gay child is more fertile on average than her counterparts solely giving birth to heterosexual babies. (Of course, “researchability” has been influenced by the spread of modern contraceptive methods.) A theory has been based on the above statistic: Xq28, which is part of the gene located on the X-chromosome, and responsible for the development of homosexuality among others (Dean Hamer, 1993³), re-reproduces its own “lost” reproductive activity. That is, homosexuals are not against reproduction, on the contrary, they form a biological community together with them. That is how a hypothesis (Robert Trevis, 1994⁴) has been confirmed: if nature produces a genetic group like that, it should have a biological-communal function.

Influenced by the results of the above research, the latest and most dynamically developing branch of psychology claims that, in a complex society, heterosexuals are responsible for reproduction, the growth of the community in size and quality, but the “homosexual alliance”⁵ ensures the unity and social coherence of the community. Thus heterosexual reproduction and homosexual alliance together form a natural and healthy society.

This can be formally calculated using Hamilton’s rule⁶, which lays down a sociobiological function principle (applying not only to homosexuals) according to which a direct reproductive branch, e.g. the quality of heterosexual genesis, is influenced by indirect factors such as caring for and strengthening the chances of transmitting a useful gene. Known as “genetic fitness”⁷, e.g. a homosexual uncle helps the most efficient offspring since it is his own positive genetic pattern. After all, not only quantitative but also qualitative reproduction is needed to generate a healthy population.⁸

Such a follow-up, communal, qualitative indirect reproductive job (whose patterns are found in a line of tribal societies) can be fulfilled by lesbians and homosexuals under certain circumstances. That is, if lost direct reproduction is counterbalanced by

² <http://www.origo.hu/print/tudomany/elet/20041013.meglepo.html>

³ <http://www.origo.hu/print/tudomany/elet/20041013.meglepo.html> and Bereczkei 2003: 198-203.

⁴ <http://www.origo.hu/print/tudomany/elet/20041013.meglepo.html>

⁵ Bereczkei 2003: 198-203

⁶ Bereczkei 2003: 44-47

⁷ See *ibid.*

⁸ See Neodarwinist phenomenon of kin selection, *ibid.*

indirect activities improving the quality of reproduction (also referred to as “genetic fitness”), reproduction is not lost after all: it will become more precious. (In the case of homosexuals, it was specially confirmed by the aforementioned study by Camperio-Ciani ⁹).

It may be concluded that, in a sociobiological sense of the word, homosexuals not only strengthen genetic fitness but also social cohesion and adaptivity (receptive care) which might as well be called “sociofitness”¹⁰.

Actually, homosexuals are cohesive forces of the society and culture (in a heterosexual society they also have the same, helping function); society cannot be imagined without them in the sociological sense of the word. Consequently, one cannot think of a sociological, let alone a “caring” biological community either (see: social and biological “cohesion theories”)...

An interesting parallel and counterpoint are hidden here in one: at the humanistic and socioscientific level, ancient Greek scholars such as Plato, Plutarch, Pseudo – Lucian¹¹, also claimed the above, sometimes in a more open way than today. According to them, the Greek society would not have been able to survive without homoeroticism (“eroticos”); while heterosexuality included only the reproductive duties of the Greek society. According to the Greeks, although reproduction was undoubtedly a more ancient task, homosexuality ensured the conditions for a sociocultural structure of a higher level. “Aphrodite Pandemos” (i.e. “common” Aphrodite¹²) was the representative of marriage as an institution, while Eros represented culture, morality, social sophistication, i.e. homosexuality. But they could not be aware of modern scientific and social research, including e.g. empirical and sociopsychological research. Thus it remained a kind of tradition. Many modern scientists knew it – or did not know it – as the “perversion” of a bygone world.

Homosexuals preserved this social, moreover, sociocultural, artistic function of theirs in eras when they suffered harassment. Let us mention Leonardo’s biography by

⁹ See *ibid.*

¹⁰ See Bereczkei 2003: 198-203

¹¹ M. Foucault: A szexualitás története (The History of Sexuality – in Hungarian) Vol. III. Bp. Atlantisz, 1999, 201-239

¹² See Symposium by Plato (in Hungarian) in: The Collected Works of Plato, Vol. I., Európa, Bp. 1984. p. 958, d.192

Vasari according to which Leonardo da Vinci was imprisoned for sodomy (i.e. homosexual activity) at the age of 23; his three homosexual companions were burnt. Leonardo painted the most beautiful illustrations of a “lesbian mother” in his works entitled “The Virgin and Child with St Anne”, and “Madonna and Child with St Anne and the Young St John”. In these paintings, Mary and Anne adore the child with their thighs entwined: it is the most beautiful example of mutual and caring lesbian love¹³...

Mention must also be made here of the “highly confidential” order of 1936 by SS fuhrer Himmler according to which homosexual and lesbian artists could only gradually be removed “from circulation” (homosexuals were to be deported to death camps, lesbians were to be re-oriented) so as not to stir social scandal and indignation ... Well, a “top nazi” was supposed to even pay attention to affairs like this¹⁴.

Let us not forget, nazism could not have been created without the internal but outward directed cohesion of “SA”, the homosexual elite corps ... It was them, who eventually became the first victims of the regime they had created.¹⁵

But where does this immense homophobia originate from?

According to the above models, homosexuality is an aid and natural ally to heterosexuality. But while homosexuality is built inward, towards the inner, still open integrity of the independent individual, with respect to him, his adaptation and involvement, heterosexuality, due to reproduction, prefers expansive and spreading, still closed couple and family relations. In most cases, because of its external expansion but emotional closedness it does not recognize integrative social and biological strategies and functions, which are of linking and uniting force, but openly homosexual for the individual. Homosexuality is a representative of such alliance, independent of kinship, but this strategy and attitude is against the heterosexual strategy and attitude for the moment being.

The only solution to overcome homophobia lies in the understanding and acceptance of the biological, social and cultural function, role and necessity of homosexuality, listed above.

¹³ Teréz Virág: Zeneiség és perverszió Leonardo életében (in Hungarian) in “Mély kútba tekinték” by herself, Animula Kiadó, Bp. 1994, pp. 99-108

¹⁴ Grau 2001: 344-388

¹⁵ See *ibid.*

We wish to demonstrate that the anthropologic dualisms and psychic strategies, outlined earlier, are basically the same in each era, they are simply in a different cultural background: we are back to the dualism of empathic emotions and sexual independence, that is the presumed sexual-strategic effect of vasopressin in gay men.

Possible molecular biology and genetics of homosexuality

A: Bioeticism of research history

Can this topic be researched in an ethical way?

Even the homosexuals questions this, and they are right to do so.

In the 1950s, testosterone treatment was an established practice in psychiatry; despite all the hopes, it did not actually stop male homosexuality, on the contrary, it increased homoerotic desire. It was all done without a scientific-empirical basis, prejudices were made into practice, according to which homosexuals are feminine, and a method of treatment like this cures homosexuality via inhibiting femininity¹⁶.

Based on the multicentered exact and ethical research of the 1970s, now we know there is not a significant difference in the serum levels of testosterone and governing hormones of the pituitary gland (FSH) between homosexual and heterosexual men in a large population. According to a 1977 West-Berlin survey, the serum FSH and LH levels were definitely higher in 33 among 100 homosexual men in the control group (in approximately one third of the control group this was true of the LH level), while no significant differences could be detected in the FSH and LH levels in the rest of the sample. Free testosterone levels were slightly higher in homosexuals but it could not be regarded as the categorical form of significant difference¹⁷. This may lead to the conclusion according to which sex hormones do not basically influence sexual orientation.

In the meantime, due to a lot of real corrupt practices, homosexuals have unfortunately been deterred from participation in biological experiments because they

¹⁶ McLaren 2002: 146-222

¹⁷ See: Ruhde W., Stahl F., Dormer G.: "Plasma basal levels of FHS, LH and testosterone in homosexual man", *Endokrinologie*, 1977, 70 (3), p. 241-248

have been regarded “medical” ones. This has been an explicit trend (under the influence by Michel Foucault¹⁸) as the homosexual movement has sharply denounced any differences, including biological ones, since 1969 in fear of a scientific “re-ghettoization” instead of social emancipation.

Dean Hamer, head of the team having discovered genetic factor Xq28 and other genetic factors “responsible” for homosexuality¹⁹ (as, revealed in experiments on identical twins, it is a determinant factor in only 50%) received two telephone calls from two different homosexual organizations after his scientific publication in 1993 according to which

1. he proved that homosexuality was biologically natural and
2. he was a “fascist” ...

There is, however, a new research trend, simply owing to the above discoveries, according to which homosexuality is biologically natural as it serves cohesion in a sociobiological environment. It was strongly pushed after the hypothesis by Trevis (1994)²⁰: the gene of homosexuality must have some positive function (I would like to attach a single scientific supplement; or see HVG, June 2006)²¹.

It is at this point when the problem arises: this cannot be a medical issue since a positive malformation being a carrier of and having biological-social-psychological functions is by no means pathological. Let me give an example: if someone is 2 meters tall and has broad shoulders, he should not be operated on but should be taught how to play water polo. We are going to provide the biological details at every point, on a thematic basis; in a context like that, worries on behalf of the homosexual organizations are of no use.

B: The vasopressin hypothesis

Since homosexuality has its genetic factor on the X-chromosome, it has a positive influence on the mother’s fertility (Camperio-Ciani, 1999²²); thus, in addition to

¹⁸ See: Stonewall riots, in McLaren 252-261

¹⁹ Hamer-Copeland 1999 (in Hungarian translation 2005) 151-187

²⁰ <http://www.origo.hu/print/tudomany/elet/20041013.meglepo.html>

²¹ See HVG, 24 June 2006, XXVIII, 25 (ed:Pál Réti) pp. 87-88

²² <http://www.origo.hu/print/tudomany/elet/20041013.meglepo.html>

improving the quality of the genome, it is not lost for reproduction in the quantitative sense either. In other words (on the basis of the above), nature produces homosexuality biologically to fulfill its job in improving the quality of genes (a PhD dissertation at 60-90% of completion with references is being written on the topic).

In practice, this phenomenon is known as 'X-feedback'. Genetically speaking, it is not the effect of testis depending factor²³ on the Y chromosome that dominates in homosexuality (the biological determination of male sexuality "produces" heterosexual and homosexual men in the same way, without differences: the genetic difference is definitely related to the X chromosome, in harmony with the mother. At the same time, on the basis of familial research, it has been presumed that the mother's siblings and cousins carry that gene to all likelihood²⁴; the child of a homosexual father, however, is not at a greater risk of becoming a homosexual himself.

We do not know any of the protein inducing effects of the Xq28 portion of the gene yet; the discovery itself was an empirical one²⁵. For example, we do not know as yet what relationship there is between the electrophysiology, anatomy or neurobiochemistry of a supposedly homosexual brain and this specific portion of the gene, as it has not been researched yet.

But if homosexuality has a geneticosocial task, it must have a neurobiological one, too. This has been outlined in contemporary American and West European research; this is not medical examination any longer, but a positive anthropological experiment, which may have interesting consequences for homosexuals. Let us remember, for example, that the corpus callosum, which connects functioning between the two hemispheres of the brain, is much more developed in 70-80% of the homosexuals (LeVay, 1993²⁶). According to the latest statistical pathological investigations, it has also been shown that the corpus callosum in homosexuals contains 34% more nerve fibers (not on average) than in heterosexuals²⁷. For example, this way, Leonardo's

²³ Hamer-Copeland 1999:285

²⁴ See *ibid* and in Gábor Szendi: Psychological bases of behavior (in Hungarian) (www.behsci.sote.hu/szg-magatart.htm)

²⁵ the same and in Dean Hamer *ibid*.

²⁶ Bereczkei *ibid*. Hamer *ibid*. in Szendi *ibid*.

²⁷ See footnote 24

artistic talent can also be explained for both biologically and psychologically²⁸. However, the other differences can be shown in a large population (70-80%), and they are also found in 20-30% of the heterosexual individuals. The fear of homosexual organizations that homosexuality can be detected on the basis of an MR-investigation is therefore without foundation. Based on the investigations by Xhou et al in 1995, it has been revealed that there is a special malformation characteristic of transsexuals but not present in the homosexual individuals; in transsexual men and the female brain, however, this region is of the same size and is known as “bed nucleus”.²⁹ Perhaps this way male homosexuality and transsexuality could be distinguished using differentiated PET-MRI. For example, in transsexual men, the oxytocin-like effect may be stronger, while in homosexuals a vasopressinergic effect should be present, since homosexual identity is that of a male, and transsexuals have female identity.³⁰

At the same time, in the late 1990s, it was electrophysiologically confirmed³¹ that in homosexuals the two cerebral hemispheres were completely equal, and cooperated much better than in heterosexuals. This might explain for the homosexuals’ increased symbol-forming and rational capacities, similarly to their handling of the parallel between sensitivity and sense (homosexuals were proven empirically to have a much stronger empathic ability, in a large population, using psychological methods, [Salais and Fischer, 1995]³²). There have been studies in which homosexuals’ spatial coordination capacities appear to be poorer if examined in a large population.³³

That is why a special pilot EEG measurement concerning the electrophysiological cooperation between the two cerebral hemispheres would largely be cost-effective; if the hemispheres cooperate better, a more developed corpus callosum can be hypothesized. The presumed relationship has been

²⁸ Teréz Virág: Zeneiség és perverzió Leonardo életében (in Hungarian) in “Mély kútba tekinték” by herself, Animula Kiadó, Bp. 1994, pp. 99-108

²⁹ See footnote 24

³⁰ See Appendices 1 and 2

³¹ Bereczkei *ibid.*, Szendi *ibid.*

³² Bereczkei *ibid.*

³³ See Bereczkei 199: Homosexuals achieve poorer in tests on spatial geometry, and their cerebral lateralization is also poorer.

established now. The electrophysiological investigation has been elaborated owing to the neuroanatomic presumptions we have referred to.

In the 1990s, the functioning of the female brain was tested using PET (1994), but no imaging technique has been applied to examine the “homosexual brain” yet³⁴. A classical measuring technique using EEG was elaborated by Alexander J.E. Sufka K. J., 1993³⁵.

According to our opinion, however (since we do our job in a milieu like this), the contemporary Hungarian gay population would receive a similar experiment with expressed apathy. What we still miss is actually an open social conversation, which does not exist in Hungary. As for us, complete indifference would be the better approach. In the worse case, the medium to be examined would be closed and hostile; in the United States, where this is an everyday topic, homosexuality still stirs major emotional upset and, often, causes unnecessary confrontation (let us just remember articles on homosexuality on the homepage of the American Psychological Association, and the research by Dean Hamer).

As it was mentioned earlier, it is public knowledge now, that the two cerebral hemispheres in homosexuals are equal from a psychophysiological point of view, as their corpus callosum is many times more developed compared to the large-population-average of heterosexual males³⁶.

There are studies of uncertain meaning, however, and they are more interesting: it was revealed in anatomical dissections that certain areas of the hypothalamus, the centers of human psychosexuality, contain nuclei of different sizes in the brain of homosexual and heterosexual men, in a large population (LeVay, 1993, Swaab, 1992³⁷). A whole new ballgame is that it was established via anatomical dissection, moreover, against a dubious ethical background: LeVay, e.g., performed autopsy on gay men who had died of AIDS as the HIV-boom was at its highest in western homosexual subcultures; today the majority of the infected are heterosexual.

³⁴ Szendi, *ibid.*

³⁵ Alexander J.E., Sufka K.J.: Cerebral lateralization in homosexual males: a preliminary EEG investigation, *International Journal of Psychophysiology*, 15 November 1993, 269-274

³⁶ See *ibid.*

³⁷ Bereczkei *ibid.*, Szendi *ibid.*, Hamer *ibid.*

In animal experiments, Dean Hamer³⁸ and his team demonstrated that the sexual control of two kin species (field mouse and mountain mouse, one of them being polygamous, the other one monogamous) showed differences because the monogamous species has a much higher vasopressin level, that is why it “possesses” and this influences its sexual behavior. The genetic context of the above is also being searched for. At the same time, monogamy is accompanied with possessing while polygamy is characterized by open sexuality; this is also attributed to the different control effect of vasopressin on males.

The topic becomes interesting from this point on because:

1. Vasopressin is synthesized in the hypothalamus.
2. The process takes place in an area where the hypothalamic nuclei in gay men are of different size. The direct relationship is as follows: The other anatomical difference in the brain, which is significant in the majority of cases, is the small size or total absence of the INAH-3 nucleus in the hypothalamus (LeVay 1993³⁹). There are four such nuclei (INAH 1-4) in the hypothalamus, which are responsible for human sexus. Among the nuclei, it is the aforementioned INAH-3, where the significant difference between homosexual and heterosexual men can be detected⁴⁰. We hardly know anything about the functioning of this nucleus, all we have is just foreknowledge. For example, according to some neurophysiological research, this hypothalamic region is responsible for the “possessive” behavior of males in the animal kingdom. A hypothetic suspicion arises at this point: it was suggested earlier that, in the optimal case, homosexuals assertively try to achieve and respect other people’s independence, without any desire of possession in their interactive relationships. Is the heterosexuals’ possessive approach turned off in this case, creating the special intimate relationships as it has been described in the main text?

In homosexuals, the hypothalamic nuclei secreting vasopressin are located in a hypothalamic region together with large anterior commissures and the enlarged suprachiasmatic nucleus discovered by Swaab et al in 1992.

³⁸ See Dean Hamer p. 165

³⁹ Bereczkei *ibid.*, Szendi *ibid.*, Hamer *ibid.*

⁴⁰ Endre Czeizel, Erika Erős (in Hungarian): Számadás a tálentomról – An account of talent (The genetic analysis of the Karinty family) Corvina, Bp. 1995) and Gábor Szendi (in Hungarian): A magatartás pszichológiai alapjai (Psychological bases of behavior) (www.behsci.sote.hu/szg-magatart.htm)

Vasopressin is synthesized along these regions in the supraoptic and periventricular nuclei of the hypothalamus.⁴¹ Among the lately discovered functions of vasopressin, demonstrated in experimental mice, the males' polygamous-monogamous, obtaining-possessing-preserving sexual function should be mentioned; it is genetically encoded in mice. Think of an interesting hypothesis from a psychological point of view: as it was mentioned earlier, homosexuality is not possessive and open basically; in homosexual men, the differences are also found in these regions. We do not intend to build our ideas on biology, on the contrary, we are looking for biological analogons to psychological models. It should be mentioned, however, that bisexuality, homosexuality and transsexuality were not scientifically differentiated in the aforementioned studies either.⁴² Similarly to genetics, natural science should get support from a net of humanities and social science, which is discussed in the two appendices.

Hypothalamic differences are presumably related to differences in the corpus callosum, since, on the basis of the Swaab studies, hypothalamic control is also much more complicated than the relationship of the four INAH nuclei. This was clearly pointed out from a neuroanatomical point of view by the Swaab study of 1992. According to the interpretation by Swaab, these malformations present a transition between the brains of a heterosexual male and female. After the electrophysiological investigations, many claimed there existed a special, "homosexual brain" which was neither male or female, let alone, a transitional one but an individual, positive, functional malformation. Teréz Virág, psychoanalyst,⁴³ explained Leonardo's artistic genius by this reason. His relationship with his biological and foster mother was explained the same way, this can similarly be accounted for by the X-feedback; the references, including the anatomical ones, will also be presented in the *dissertation*.⁴⁴

⁴¹ See MSD Orvosi Kézikönyv (The Merck Manual), ed: Robert Berkow M.D., 15 Ed. Melania Kiadó Kft., BP., 1994, p. 1058 (in Hungarian)

⁴² Szendi *ibid*.

⁴³ Teréz Virág *ibid*.

⁴⁴ See there, See in Gábor Szendi (in Hungarian): A magatartás pszichológiai alapjai (Psychological bases of behavior) (www.behsci.sote.hu/szg-magatart.htm) and also: Sobotta: Az ember anatómiájának atlasza I. (R. Putz) (Fej, nyak, felső végtag) (II.[Hungarian] Edition, Alliter Kiadó és Oktatásfejlesztő Alapítvány) (Bp. 2004);

3. It is well known psychologically and socially alike, that homosexuals are much more independent, their sexus is more open and they are less possessive with their partners. On the other hand, they easily make contacts other than the traditional familial structures; they accept emotional structures alien to them more readily, they are more empathic (see: This was psychologically justified in a large population [Salais&Fischer, 1995⁴⁵]).

Dean Hamer and his team made an all-round research of the topic, still they did not hit upon the simple logical and semantic relationship, which we have now as a hypothesis. (He has been a Nobel Prize nominee in medicine several times.)

The experiment was originally planned to take place in the USA, but the University of Debrecen proposed to carry out this PET-research in Hungary. But we have to consider the following facts:

1. The Hungarian, and especially the gay public is very sensitive to this issue – on good grounds.
2. Financially, we can put in applications for American and Hungarian venture capital, but to get it, profit orientation and university research should be alloyed.
3. The elaboration of the humanities is highly important since it has not been done in the USA. We have the experts in humanities; sensible social communication about the scientific-ethical issues can only be launched after this step has been taken. *We can safely claim that this experiment is not considered unethical for several reasons, as it will be detailed soon.*

We have a staff of experts in molecular biology and, also, humanities (psychologists, sociologists). The humanities are also important because homosexuality, transsexuality and bisexuality have not been accurately distinguished in research yet, therefore the investigated samples have been misleading as a matter of course. What we need is the physical and scientific environment and qualified staff.

p. 294; MSD Orvosi Kézikönyv (The Merck Manual) (First Hungarian Edition, 1994) (Melánia Kiadó Kft, Bp. Chief ed: Robert Berkow, M.D.); p 1058; Sándor Jászberényi: A hűség mítosza (in Hungarian) (According to the latest research genes also influence monogamy) in Népszabadság hétvége. Saturday, 11/12/ 2005 (Chief ed: Károly T. Vörös)

⁴⁵ Bereczkei ibid.

Experimental schedule: the experiments are based on transmitting isotope-labeled vasopressin molecules into blood circulation and checking which hypothalamic region they accumulate in over a certain period of time, using the PET technique. The basic hypothesis may be justified by higher or lower accumulation rates in certain regions.

Experimental model: the first experiment will take place in a pilot group of 20-25 people with the participation of homosexual and straight men, 50% each, under full psychological and social control. Next, the findings will be analyzed and discussed. *This experiment should basically justify our hypothesis, so it will only be worth continuing if the results are straightforward – but should that be the case, continuation is a must. For the moment being, this is what we are asking American experts to do for us. Naturally, the individuals will be screened using Kinsey's self-confession method, which is not quite reliable, but there is nothing better for the moment being. According to Kinsey's scale, category 0 represents fully heterosexual, meanwhile category 6 stands for fully homosexual subjects. We will request sociologists and psychologists to do this part of the test. In addition, we will need a special questionnaire to spot and differentiate transsexuality and transvestitism, which cannot be done using Kinsey's orientation-specific method.*⁴⁶

Of course, complex medical screening is necessary since the subjects in the study should be healthy homosexuals and heterosexual men. Special attention has to be paid to neurological, psychiatric and endocrine diseases.

The second stage will involve a sample of 200-250 individuals, the orientation of the sample being known and unfamiliar for us in 50% each. In the next step, it will be compared to the first set of investigations followed by evaluation and discussion.

In the third stage, we will include increasingly more subjects, on the basis of the first and second experimental stage.

⁴⁶ See McLaren 197-201

As only 4 mm³ patches can be detected during the PET measurements, an exact anatomic parallel should simultaneously be measured. Since in soft tissues like this computer tomography is not really suitable for anatomical labeling, the parallel measurement should definitely be an MRI one, plus informatic addition is also required in the PET measurements, which will also take place at the University of Debrecen. The INAH-3 nucleus in a large population of homosexuals is 3 mm³, in a sample of heterosexual large population it is as much as 10 mm³ (LeVay 1993⁴⁷).

Groundlessness of the historic fear on behalf of the gay society in the current study: as it is evident for a scientific minded individual, the neural and neuroendocrine structures of the hypothalamus have a scale-independent pattern, i.e. no one can be made more homosexual or heterosexual by applying vasopressin titration since we are dealing with a case of power-function distribution here: vasopressin input is not necessarily accompanied by a straightforward linear output.

The administration of vasopressin in experimental doses is not dangerous at all; just to remember an example: young children are given this agent in much larger doses⁴⁸ if they suffer from night bed-wetting (enuresis nocturna). However, we will not stain vasopressin; instead we are going to use its closest analog as we can make this technical solution. This substance cannot have a much different effect than that of the endogenous vasopressin. Of course OGYI (the National Pharmacological Institute in Hungary) will also follow up the study and the whole of the experiments will be under the close surveillance of the Ethical Committee of the Faculty of Medicine.

Discussion of the hypothesis: This will be the first molecular biological investigation into homosexuality in which the hypothesis is based on scientific evidence. Homosexuality will be researched among physiological circumstances, the consequences being of humanistic and psychological nature. It has never

⁴⁷ Hamer ibid., Bereczkei ibid., Szendi ibid.

⁴⁸ MSD, p. 1647

happened in the essentialistic investigation into homosexuality, although it is realistic and can be done.

(It does not mean the neglect of other biological factors, e.g. the activity of the D4-domainreceptor under the influence of large-dose cocaine⁴⁹, etc.). This is only focusing at a central research opportunity from the aspect of both the humanities and sciences.)

C: other models

2. The genetic presence of vasopressin in rodents has been known since 1999⁵⁰, even genetic manipulation has been performed, which has significantly changed the sexual strategies of the male.
3. Midges were genetically manipulated to make some individuals homosexual, but not on the vasopressin gene⁵¹ (according to our presumption, vasopressin is not the hormone of homosexuality, but one that controls other sexual strategies in homosexuality: the picture is highly complicated). The examination itself was made on the Xq28 portion of the gene, which was discovered by Dean Hamer in 1993. Genetic engineering was applied on midge in 1999, when each of the genetically treated midges turned homosexual. We should not forget one thing, however: statistical genetic investigations (research into identical twins) have shown that the biological-genetic determination of homosexuality (currently researched by us) is maximum 52%⁵².
4. A study on vasopressin would be interesting because homosexuality and heterosexuality, including all their specific features, could be compared using biochemical, anatomical, sociological and psychological methods in a single model, as it was outlined above. It would be a novelty for both biologists and

⁴⁹ Dean Hamer, 124-155

⁵⁰ Dean Hamer 151-188

⁵¹ Szendi G. *ibid.*

⁵² See Dean Hamer *ibid.*

http://books.google.hu/books?id=1DozhsRW9LMC&pg=PA376&lpg=PA376&dq=gay+midges,+Xq28&source=bl&ots=8MOHNrnDfx&sig=tjJP0IHft-MqA5cHh0dB1QWiHZA&hl=hu&sa=X&ei=7Uv7T_vgGOip4gTW1qn2Bg&ved=0CFoQ6AEwBQ#v=onepage&q&f=false

psychologists since neither the anatomical nor biochemical semantic contents of the hypothalamus have been revealed yet. Therefore, psychological, sociopsychological and socioanthropological hypotheses will be required on a continuous basis, which will give biologists an impetus in their work. In the same breath, the mapping of a scientific “blind spot”, i.e. that of the hypothalamus can also be done.

5. Despite the fact that the anatomical markers of lesbianism are not known yet, (since there was no AIDS-boom in the lesbian subculture, or no autopsies of affected victims were performed either) psychologists suggested revealing which of the hormones manufactured by the hypothalamus was responsible for controlling female sexual behavior in the hypothalamus and, also, in the history of lesbianism, being associated with maternity and the control of uterine contractions in a psychological and physical way, respectively. The answer is simple; it was oxytocin⁵³. We should keep in mind: there are no accurate anatomical markers at our disposal but we know that control is done via the hypothalamus. In the long run, we should give the idea a second thought later when we know more about the neurological structure of the hypothalamus.

The pathological neuroanatomical changes revealed by the Swaab study (1992⁵⁴) are of interest for this specific reason. They were interpreted as if they presented a transition between a female and male hypothalamus.

Investigating into the electrophysiology of the brain we could see that the representatives of the homosexual male brain could be interpreted as individual nosological strategies rather than clear transitions. As it was shown, however, transsexuality and homosexuality were not and could not be distinguished in pathological investigations. We are going to provide both a psychological and sexualanthropological differentiation (as it is described in the two appendices) using humanities' methods such as the classical surveying techniques, because if the sexual identity is that of a male's, orientation is also directed towards males and the person is homosexual, if the sexual identity is that of a female's, he is transsexual. If the individual's identity is that of a male's, the orientation is

⁵³ MSD Orvosi Kézikönyv, p. 1058 (in Hungarian)

directed towards men but female roles are also detected, the person is a homosexual transvestite. These three highly different categories have to be distinguished during the scientific investigations⁵⁵.

This is interesting from the viewpoint of the vasopressin-oxytocin relationship⁵⁶ since only two of the amino acids in the two neuropeptides (nonapeptides) consisting of 9 amino acids⁵⁷ are different from each other, moreover, they are produced in the same region: the supraoptic and periventricular nuclei of the hypothalamus⁵⁸. For example, lysine-vasopressin, the vasopressin analog, exhibits mild, oxytocin-like effects, but this is not significant yet. But there are vasopressin analogs of expressed oxytocin effect, depending on how the order of amino acids is modified. At the beginning we wanted to make use of lysine-vasopressin, but realized it was worth looking for more aspecific and chemospecific analogs than lysine-vasopressin, which is quite similar to physiological vasopressin. This material is separately discussed in the Abstract and also in the coming chapters.

A question arises here: Do transsexuals possibly manufacture vasopressin analogs of much more “feminine” structure or does oxytocin completely oust vasopressin production in the regions round the supraschiasmatic nucleus⁵⁹, which is much larger and more developed in transsexual individuals. Or do vasopressin-producing regions (which are the same as the oxytocin-manufacturing ones) synthesize oxytocin-like substances, or is it perhaps oxytocin that ousts vasopressin-production, etc.? All this, and the modified supraschiasmatic nucleus could give a molecular biological explanation for transsexuality, which means a transsexual is a female in a male body.

Gay transvestism can also be explained for using this model, as far as the gender role is regarded since we know these peptides are broken down extremely fast. In the case of a gay transvestite, for example, it is possible that vasopressin

⁵⁴ Szendi *ibid.*

⁵⁵ See Chapter 1

⁵⁶ MSD p. 1058

⁵⁷ MSD p. 1054

⁵⁸ See *ibid.*

⁵⁹ Szendi *ibid.*

produces oxytocin-like metabolites while he is “changing”, or, temporarily, a dominant oxytocin-effect is observed which then results in vasopressin dominance again. All this is so because the majority of gay transvestites are stable males by identity in most of the cases⁶⁰.

It has become a psychological evidence now, that basic male strategies are equally valid for gay and heterosexual men, while basic female strategies characterize lesbian and heterosexual women alike. For example, all women consider the third party or rival dangerous due to her prettiness, while every man considers the third person dangerous due to his social and financial position, as it has been shown in large-population sociological investigations (Kendrick 1995, Buunk and Dijkstra 2001)⁶¹.

Thus homosexuals and lesbians have to be looked for on the grounds of the sexual strategic effect associated with vasopressin and oxytocin effects, respectively. Moreover, the topographic and quantitative distribution and its specificity account for lesbianism and homosexuality. Still the neurohormone is the same, but of different distribution, as it was outlined earlier.

But, based on the above, a biochemical basis of the lesbian/homosexual alliance can also be presumed. If we are aware of the anatomical, topographic and structural differences even within the neurohormone, it is possible to biochemically interpret the psychological strategic analogies, such as increased autonomy, increased sensitivity, etc.⁶²

Let us think that we presume homosexuals have a lower vasopressin activity in these nuclei, while lesbians may exhibit higher oxytocin activity, because they put more stress on femininity and motherhood; biochemically speaking, the two also represent a social and structural analogy.

It is quite possible that vasopressin is the most important neurohormone of the above homosexual strategy owing to its quantitative (1), topographic (2) effect and oxytocin-like changes or re-structuring (3). A switch between heterosexuality and homosexuality is also known at the molecular biological level in bisexuals

⁶⁰ See e.g. the two appendices

⁶¹ Bereczkei inbd.

⁶² Ibid.

(some of the literature on the topic is also available in Hungarian, see: '*Living with our genes*' by Hamer-Copeland). But this does not apply for homosexuals and heterosexuals in general. It has been almost completely explored in the United States, as it will be outlined genetically in the coming chapters.

During the research of a well-known substance, cocaine, which is the strongest dopamine inductor, it was revealed that certain doses of this substance caused the high activation of the D4-dopamine receptor in the limbic system⁶³. Based on PET research now we know the D4 receptor is sexually responsible for adventurous behavior. Its genetic marker, D4DR⁶⁴ has also been found. From a genetic point of view it is interesting to note that in heterosexual men it is an extremely short genetic sequence, it is somewhat longer in homosexuals, while it is relatively long in bisexual men. Based on the above, Hamer and his colleagues came to the conclusion that in bisexuality the length serves as a switch between the components; but at sites where another component is missing, it may not be effective by itself. One cannot be made gay or straight by activating the D4 receptor but in a (hidden) bisexual the component from the background is pushed into the foreground in the form of seeking for adventure. A humanities analog denies self-contained bisexual identity, it only recognizes homosexuality or heterosexuality (Lauman 2000, Judit Takács 2004)⁶⁵. From a neurobiological point of view it is interesting to bear in mind that there is an antipsychotic that also blocks psychosexual activities via the D4 dopamine receptor. The drug is known as clozapine (Leponex) which is hardly in use today, due to its dangerous side effects. I am not going to give details about its known effects; anyway, even after 30 years in circulation, new facts are revealed about this molecule⁶⁶.

It is now clear, that the D4 dopamine receptor is not responsible for the development of homosexual or heterosexual strategies by itself, but it has a function to switch between the entities of existing male bisexuality. For example,

⁶³ See Hamer pp. 46-49

⁶⁴ See *ibid.*

⁶⁵ Bereczkei, *ibid.*, Homosexuality and the society (in Hungarian), Új Mandátum Kiadó, Bp. 2004, pp. 141-169

⁶⁶ Korszerű Orvosi Diagnosztika és Terápia / Current Medical Diagnosis and Treatment 2003 (in Hungarian) 5th Hungarian edition, Eds: Lawrence M. Tierney, Jr. M.D., Stephen J: McPhee, M.D., Maxine A. Papadakis M.D., Bp. OM, p. 1029

the homosexual component is very weak and not realized⁶⁷; dopamine 4 acts as a sexual switch, which is known genetically and in human biology alike. (Perhaps this is the point when we can ask the question in a biochemical approach: why is there not independent bisexual identity?⁶⁸ Bisexuals usually have gay or heterosexual variables of identity, too.)

Thus it can be hypothesized – examining only the sexual factor in each of the neurohormones [we are going to concentrate our attention on it] – that non-possessive behavior, e.g. open sexus (low vasopressin level) is accompanied with high D4 activity. It can also be structured in time: vasopressin activates D4 because this is the sexual strategy that activates behavior to seek adventure. High vasopressin levels are accompanied with low D4 activity; see the monogamous strategy, in which adventure is missing.

Studying serotonin, Dean Hamer and his team have demonstrated (while looking for the so-called ‘Prozac-gene’)⁶⁹ that the activity of serotonin transmission is not orientation specific, i.e. there is no significant difference between the gay and straight concept of serotonin. But, at the same time, serotonin is the hormone of sexual gratification, i.e. it is the neurohormone of the level of impulsion.⁷⁰ If the serological level is low the impulsion is high and there is no gratification but if the serological level is high the individual is gratified independently of his orientation.

This is an interesting problem because the general opinion according to which the gay have a higher sexual impulsion is false; but since their strategy is more independent and open, it is worth researching this field.

During orgasm, the dopamine level changes in time with the serotonin level: if gratification has taken place, the D4 activity decreases while serotonin shoots up, but if the D4 activity remains high, it results in low serotonin levels (there is no orgasm). After an orgasm, however, the serotonin level remains high, after some time it decreases to the normal range with balanced D4 activity after a certain time.

The D4 function is associated with phenylethylamine activity, while serotonin

⁶⁷ Hamer ibid.

⁶⁸ See footnote 100

⁶⁹ Hamer pp. 101-108

⁷⁰ Hamer pp. 101-138 and MSD p. 1054, Korszerű Orvosi diagnosztika és Terápia 2003, p. 1054. **See e.g. that serotonin is responsible not only for sexual impulsion bur also alcohol abuse.**

function is associated with endorphin activity, but this can differentially alter in the homosexuals.⁷¹

In the current publication this is only remarked but not mapped.

High serotonin levels, however, can re-instate the high vasopressin levels, rendering the strategy to be a closed one; there is no more search for adventure, etc.

This may hold true in each male orgasm, but based on this, a bisexual orgasm can be described similarly to a homosexual or heterosexual one in its (1) strategy and (2) switch or switch of impulsion.

As a matter of fact, we are not talking about homosexuality alone, any longer, but, if our hypothesis is correct, we can explore the complete sexual strategy in a male, its relation to that of a female, from sexual strategy to a search for adventure and swing of impulsion.

Thus serotonin, although it is not directly related to the orientation of the individual, can respond to sexual strategy for the moment being or a transitional period of time. At the same time, long-term serotonin levels can be independent of this, e.g. the serotonin level falls back to its previous standard level after gratification (see **Atila Szabó**). Thus the strategic order regulates the quality and intensity of orgasm.

Orgasm-models so far disregarded vasopressin and oxytocin, although it has been an established fact since the 1990s that, in the animal kingdom⁷², this is the agent controlling sexual strategies in male and female animals, and possibly, also in humans. That is how our model is new from a neuroendocrinological point of view, and that is also why the various types of sexual orientation can be differentiated by this model theoretically.

If we reverse the same psychobiological hypothesis, high vasopressin levels are supposed to imply higher serotonin levels accordingly, i.e. there is no search for adventure: **the level of sexual impulsion and adventure-seeking are controlled by strategy.**

⁷¹ MSD pp. 1054-1100

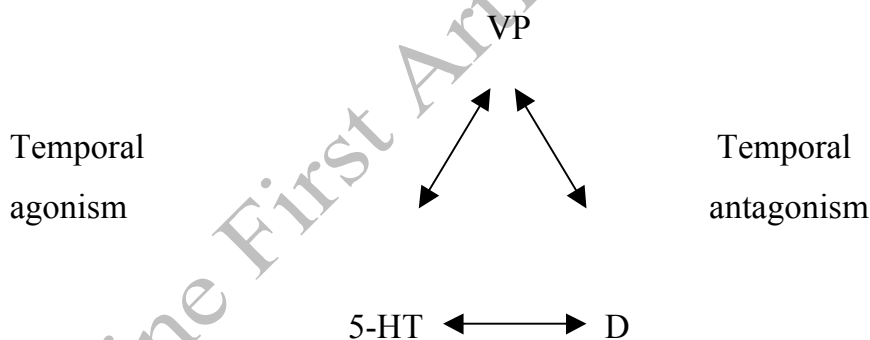
⁷² Dean Hamer pp. 151-188

Therefore, the vasopressin strategy may carry the complex varieties of role – adventure – impulsion. At the same time, gay sexus or bisexus is only one special case, and in the meantime, male psychobiology can be described.

The complex relationship of the above will be discussed later – beyond homosexuality. Homosexuality is only one of its independent topographic, quantitative and structural malformations, as it was seen earlier.

DIAGRAM OF THE BASIC MODEL

Vasopressin: VP = strategy
 Dopamine: D = change
 Serotonin: 5-HT = impulsion



Homosexuality research de facto (but not exclusively) made us aware that what we call or reckon as sexual will is also programmed. Though this does not happen at the level of sexual behavior or hypophysis hormones by which we can elevate the sexual desire⁷³ but we can only amplify the decision and cannot change it. (E.g. Testosterone elevates the gay sexual desire as it also elevates the heterosexual desire depending on

⁷³ An infamous experiment in the 1950s was the “testosterone treatment” of gay men. This is how it was found that testosterone increased the homoerotic desire in gay men. **Angus McLaren: Twentieth Century Sex: A History** Oxford: Blackwell Publishers, 1999.; pp100-200

the individual but it does not interfere with the “higher codedness” of the will. We also know that there is no significant difference between the free testosterone level of gay and hetero males. An important difference that could clearly identify gayness or homosexuality cannot be proven at the level of hypophysis hormones either.)⁷⁴

We are also aware that e.g. GHB⁷⁵ relieves sexual blockades (since it is the precursor of GABA thus it is a dopamine-inductor⁷⁶ and by this it turns the will decision off but it does not influence the strategy of „the will” itself. Viz. there is a higher codedness, which we can name anyhow, even free will or any kind of will, which guides every individual to make their own decisions and strategies.

This is vasopressin in male individuals and oxytocin⁷⁷ in females. At a low degree of concentration vasopressin causes openness in the sexual life and an independent horizontal object relation, association type; at a high hypothalamic degree of concentration it induces monogamy and patrilineal ”family” possession. We also know that in terms of evolutionary psychology the strategy mentioned first is considered as homosexual the second one is considered as rather heterosexual⁷⁸. Moreover, vasopressin is produced⁷⁹ at a site where – probably - because of hypertrophy, gay men have enlarged nuclei.⁸⁰ Due to the fact that this does not only apply to gay men but it embraces the whole of the male strategy (including the heterosexual): the molecular genesis of male sexuality can be mapped. As it is also known that

⁷⁴ See Rohde W., Stahl F., Dormer G.: ”Plasma Basal Levels of FSH, LH and testosterone in homosexual men”, *Endokrinologie*, 1977., 70 (30), pp. 241-248

⁷⁵ Current Medical Diagnosis and Treatment, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1575)

⁷⁶ Current Medical Diagnosis and Treatment, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1575)

⁷⁷ **The Merck Manual** of Diagnosis and Therapy, Merck Research Laboratories, Rahway NJ, 1992. (in Hungarian translation p.1058)

⁷⁸ Dean Hamer – Peter Copeland *Living with our Genes – Why They Matter More Than You Think*, New York, 1999, Enchore Books, Doubleday pp. 151-188.

⁷⁹ Vasopressin and oxytocin are produced in the supraoptic and periventricular nuclei of the hypothalamus, while they are anatomically located hard by the probably hypertrophized anterior commissurae (with the 70-80% of the gay people measured in a big population) and the enlarged nucleus suprachiasmaticus – this was shown by Swaab and his colleagues in 1992. See: Dean Hamer – Peter Copeland *Living with our Genes – Why They Matter More Than You Think*, New York, 1999, Enchore Books, Doubleday pp. 151-188. and **The Merck Manual** of Diagnosis and Therapy, Merck Research Laboratories, Rahway NJ, 1992. (in Hungarian translation p.1058)

⁸⁰ See *ibid.*

homosexuality is functionally related to the hypofunction of the INAH 3 nucleus the map of this area can also be drawn.⁸¹

It is not only homosexuality that can be modeled. For example, vasopressin differs from oxytocin only by two amino acids (e.g. transvestitism, transsexuality) and it can quickly transform and has quick metabolism.

We may learn new facts about the oxytocin control-mechanism.. In addition to female homosexuality, its topography allows for the understanding of the maternal instinct.

The vasopressin-oxytocin map can be revealed as a sequence of biological codes.

Today, in genetics, we know that bisexual transmission happens at the D4 dopamine receptor⁸² (viz. the gene sequence to define D4 is short in heterosexual males, long in homosexual males, and in bisexual males it is extra long). We are aware of the same effect of cocaine, the strongest dopamine inductor⁸³ and also of clozapine which generally blocks sexual motivation and causes sexual anergy independently from bisexuality.⁸⁴

We know that the dopamine inductor known as apomorphine⁸⁵ used to be the rival of Viagra (sildenafil)⁸⁶ too on the drug market, not only for its potency raising effect but also for its libido raising effect. It has been withdrawn from the market – inducing a major scandal, because of its cardiac and psychic side effects. The question is: if, in contrast with apomorphine, we do not interfere with sexual motivation but the sexual will itself, are we more effective? But is it not an act that should be the privilege of the Creator only?

What is the relation between these neurohormones?

⁸¹ See the results of LeVay's pathologic examination: Dean Hamer – Peter Copeland *Living with our Genes – Why They Matter More Than You Think*, New York, 1999, Enchore Books, Doubleday pp. 151-188.

⁸² See *ibid.*

⁸³ See *ibid.*

⁸⁴ *Current Medical Diagnosis and Treatment*, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1027)

⁸⁵ *Current Medical Diagnosis and Treatment*, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1027)

⁸⁶ *Current Medical Diagnosis and Treatment*, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1027)

Serotonin-transmission is permanently low in Obsessive-Compulsive-Disorder (OCD) and in depression.⁸⁷ Though its degree springs up following the orgasm this condition does not last long. (SSRIs with a permanent effect thus cause anorgasmia and a decrease in libido since they permanently keep the brain in the state of satisfaction.⁸⁸) That is probably because Dean Hamer did not consider serotonin as an agent specific of sexual orientation⁸⁹.

At the same time, a feedback-like relation exists among vasopressin as strategy, dopamine as motivation, the thus activated phenylethylamine⁹⁰ as arousal, endorphin⁹¹ as an orgasm hormone and serotonin as satisfaction impulsion controller.

1. Dopamine is only motivation
2. phenylethylamine is only excitement
3. endorphin only reaches its effective degree of concentration at orgasm.
4. Serotonin is only important in creating the experience of satisfaction.

But actually it is vasopressin and oxytocin that make up the strategy. For example, impulsion, motivation, excitement, or any kind of subconscious factor can be high but the deliberately organized strategy – quasi “will” is only indirectly affected. Based on the above mentioned “formula”, vasopressin-oxytocin is the emotional-sexual and so the anthropological strategy, a sexual strategy thus not a mere will...!!!

Thus the map of the different identities, orientations, and roles can be drawn on a clearly functional basis. But all of the four INAH nuclei (the controllers of sexuality in the hypothalamus⁹²) can be located topographically and described functionally and structurally because the anatomical and biochemical codedness behind them can be

⁸⁷ Current Medical Diagnosis and Treatment, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation p.1027)

⁸⁸ SSRI (Serotonin-Selectiv-Reuptake-Inhibitor) see in Current Medical Diagnosis and Treatment, 2003., 42/e Lange Medical books/ McGraw-Hill (in Hungarian translation pp.1037-139)

⁸⁹ Dean Hamer – Peter Copeland Living with our Genes – Why They Matter More Than You Think, New York, 1999, Enchore Books, Doubleday pp. 151-188.

⁹⁰ See in English Summary: http://www.psikofarmakoloji.org/pdf/10_2_2.pdf and Anthony Walsh *The Science of Love*, Prometheus, New York, 1996. ISBN 1 57392 091 6

⁹¹ The Columbia Encyclopedia, Sixth Edition. Copyright © 2001-05 Columbia University Press.

⁹² Dean Hamer – Peter Copeland Living with our Genes – Why They Matter More Than You Think, New York, 1999, Enchore Books, Doubleday pp. 151-188.

monitored onto each other. Now we can perhaps create a functional-organic and, at the same time, dynamic map of the hypothalamus about which we have not known much so far except in anatomical regards... That is why we use PET and MRI together at the topographic level of molecular biology.

In Huxley's utopia, "Brave New World"⁹³ there is a certain drug called "soma" which interferes with the hypothalamus and changes the habitual – sexual will. The will itself, since whoever takes this drug, will follow a different sexual-emotional strategy "of their own accord": they become promiscuous... and thus become the servants of a new individualist society by their own free will... In our research, we are practically close to such a thing like "soma" – with the vasopressin analogue ligand of ours that is almost brain specific. This is a V1/V3 antagonist, it does not interfere with the V2 renal receptors at all, it is linear (there is no disulphide bridge), it is enzyme stable, it can get through the blood-brain barrier, it can be applied in vivo, and it also has an ideal half-life period of approximately 2 hours.⁹⁴

As for all the above mentioned facts we would be the first to do such an exploration using a PET-MRI conjunct analysis. It is not the PET-MRI technology that is the innovation here but it is rather the method of gaining practical proof for our theoretical code system by this technology. What is more, this is a more precise method of analysis than genetics, in this topic.

While genetics has a 50% role in defining homosexuality (see Twin Researches⁹⁵), in our case it is 70-80%– applied in a big population. We would be the first in the world to indicate this area in a living individual in its physiologic dynamics. This possibility for indication – not talking about mapping - has not been approached as public research even in the USA: we can safely declare that we have no competitors in the public scientific world. In addition to not wanting to get engaged in expensive genetic

⁹³ Aldous Huxley: Brave New World, Harper Perennial Modern Classics; Reprint edition 1998.

⁹⁴ The V3 receptor in the brain the functioning of which is presently being explored by us. See in The Pituitary V3 Vasopressin Receptor and the Corticotroph Phenotype in Ectopic ACTH Syndrome;
<http://www.jci.org/cgi/content/abstract/97/5/1311>

⁹⁵ Dean Hamer – Peter Copeland Living with our Genes – Why They Matter More Than You Think, New York, 1999, Enchore Books, Doubleday pp. 151-188.

analyses, we could be the first to indicate e.g. the neurobiological background of homosexuality at the level of proteins. It has not been done by Dean Hamer, who found the Xq28 gene sequence in an empiric way – he still owes the protein-inductive description of this gene sequence...

Only the scientific theoretical background of the above job is given. The practical mapping of the hypothalamus and the possibility of the scientific repetition of it in another brain...is close to our theories but the resources for research and development in Hungary are very far from it. At the same time, we have the Hungarian technical and human resources.

So what does this mean?

It is the dynamic exploration of the whole hypothalamic functional structure. It would give the most important psycho-biological, sexual-biological, sexual and sexual strategic model regarding the topic. The ultimate goal of our research is the simultaneous exploration of this model and the psychological identities of the area: thus not only molecular biology can be modeled by psychology here but vice-versa. Experiments in this area have been conducted in psychopharmacology since the beginning of the 20th century, though the ligand-model of conscious decisions has not been found yet. That is why our research would be an instrumental one, too, along with the descriptive biology, e.g. with MMPI, a personality psychology test that can be applied for a big population. So we do count on the possibility that we address the psyche. Our psychological models are given for this purpose and so are the institutions such as the Department of Personality and Clinical Psychology and the Institute of Philosophy at the University of Debrecen. We can also access the necessary infrastructural facilities of The Medical and Health Science Center at the University of Debrecen with the long term project and comprehensive professional guidance of the PET-CT Center. This is where we break the ice that we can also work instrumentally from the given PET research and by this we open new interdisciplinary perspectives for our present PET-MRI analysis – beyond the modern.

OUR REFERENCES, SCIENTIFIC POSSIBILITIES, CAPACITIES IN THE PET CENTRE OF THE UNIVERSITY OF DEBRECEN

Practical Conclusion:

Positron Emission Tomography (PET) is a very sensitive method for examining the distribution of receptors in the tissues. In this method, molecules specifically bound to receptors (ligands) are labeled by radioactive isotopes and administered into the body of the examined individual (or in the case of model systems, into the laboratory animal). Following the injection, the balanced distribution of the receptor bound ligand molecules (receptor ligand complexes) in the tissue evolves after a short (generally 5-30 minutes) equilibration time. This distribution can be mapped by the PET cameras if the radioactive isotope used for Labeling has a capacity to destroy positrons. Peptides can be found among the specific ligands of the vasopressin receptors. In the PET Center at the University of Debrecen (at the Department of Nuclear Medicine) experience concerning the labeling of such molecules by PET isotopes has accumulated for many years. To all likelihood, such molecules can be labeled using radio isotopes independently of the peptide sequence. Of course, it must be made sure that the labeled peptide is still biologically active (whether or not it is still bound to the suitable receptors).

The distribution in the tissue mapped by the PET-technique can be quantified thus the possible different densities of receptors measured in different subpopulations can be shown, in case receptor density is within the sensitivity limit of the PET- technique (which is very sensitive) and the difference is significant..

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