Some remarks on the criminal law aspects of the postmortal use of medically assisted procreation techniques on the grounds of the law on infertility treatment

http://dx.doi.org/10.12775/SIT.2024.012

1. Introduction

The tremendous progress that has been made in recent decades in the use of medically assisted procreation techniques\(^1\) is without doubt an unquestionable achievement of mankind. Insemination and, above all, in vitro fertilization and embryo transfer permit an effective fight against infertility, one of the diseases of civilization, which continues to affect an ever-increasing number of couples.\(^2\) The implications of this progress are very often characterized by ambiguity and generate new, previously unknown

---

\(^1\) ART – Assisted Reproductive Technology.

problems, which require an urgent response from the legislator. Interference in human reproduction raises a number of legal and ethical dilemmas, with the need to establish its limits. However, this is extremely difficult as it concerns one of the most sublime spheres of human activity. One such issue is undoubtedly the possibility of postmortem creation of a human child.

Postmortem fertilization, or postmortem embryo transfer, as well as the extraction of gametes from a corpse for use in a medically assisted procreation procedure, constitute matters of considerable controversy, which had been the subject of heightened discussion among lawyers and ethicists long before the Act on Infertility Treatment came into force. Typically, the use of such procedures was viewed negatively.

This problem has most often been addressed in relation to the use of sperm from a deceased partner, pointing out that this is a manifestation of the woman’s selfish motives, which contravenes the principle of the good of the child. Attention was also drawn to the controversy surrounding surrogacy in the case of the use of oocytes after the donor’s death or of embryos created from her ova while she was still alive. Furthermore, questions were raised about the establishment of filiation ties and the consequences of using medically assisted procreation techniques on the grounds of succession law. Prior to the entry into force of the Infertility Treatment

---


Act, no regulations existed that would explicitly address the post-mortem aspects of medically assisted procreation. That brought to light multiple problems and the need for urgent regulation of the use of medically assisted procreation techniques in the national legal order. Questions about the scope of the right to dispose of reproductive cells after death or the legal consequences of post-mortem fertilization continued to mount, and the only way to resolve them was to refer to general principles of law and analogy.

The use of postmortem medically assisted procreation techniques can exist in various configurations, and so fundamentally determines their ethical assessment and the legal conditions of admissibility. First of all, a distinction should be made between those in which the parental project was initiated during the partners’ lifetime and those in which it was initiated after their deaths. In the first group, one can distinguish between procedures allowing the continuation of infertility treatment. Among these are the insemination with the sperm of a deceased partner that was donated during his lifetime and the transfer of an embryo created in vitro during the partners’ lifetime (from their gametes as well as from gametes from anonymous donors). It also involves the creation of an embryo from the ova of a deceased woman, taken during her and her partner’s lifetime, and the transfer into the uterus of the man’s new partner.

In contrast, the second group covers cases of postmortem harvesting of gametes. In the case of the harvesting of sperm from a corpse, subsequent insemination of the deceased man’s partner is possible. Alternatively, a situation may be envisaged in which reproductive cells taken from a corpse are used to create an embryo under extracorporeal conditions. If this involves sperm, the embryo so created will be transferred into the system of the deceased man’s partner, whereas if oocytes are taken from a corpse, an embryo created using the sperm of a living man could be implanted in the woman who is his new partner.

---

6 Consolidated text: Journal of Laws of 2020 item 442, hereinafter: F.T.A.
7 M. Nesterowicz, Problemy prawne inseminacji, p. 31.
The purpose of the study is analysis of the regulations of the F.T.A. concerning postmortem aspects of medically assisted procreation. First of all, consideration is given to the penal solutions that pertain to this issue. An attempt has been made to review them and to indicate the inconsistencies that may be aroused by their interpretation. It also identifies issues demanding further clarification.

2. Conditions for the use of medically assisted post mortem procreation techniques under the F.T.A.

First of all, it should be noted that pursuant to Article 2(1)(5) of the F.T.A., only a living person may be a donor of reproductive cells. Despite the legislator’s use of the masculine form of the noun, it is impossible to assume that the intention was to limit donation solely to male sperm. Under the Act, the donation of embryos is allowed, which makes the admissibility of egg cell donation all the more justified.\(^8\) Under Article 18(1)(2) of the F.T.A., it is not permissible to use reproductive cells taken from a donor in a medically assisted procreation procedure if the donor from whom reproductive cells were taken for the purpose of partner donation has died. Pursuant to Article 2(1)(8) of the F.T.A., partner (homologous) donation is defined as the donation of reproductive cells by a male donor for use in a female recipient to whom he is married or with whom he is living in cohabitation, confirmed by a consensual declaration of will of those persons. Such a measure implies a prohibition of insemination with the sperm of the deceased, as well as the postmortem creation, from gametes collected during the donor’s lifetime, of embryos under extracorporeal conditions.\(^9\) Thus, death of a gamete donor constitutes a negative premise for the use in a medically assisted procreation procedure of reproductive cells

---


collected while the donor was alive. Nevertheless, it is important to note that, against the background of the measures proposed by the F.T.A., no mechanisms have been created to verify whether the donor is alive. De lege ferenda this issue should be clarified at the statutory level.\textsuperscript{10}

Attention is drawn to the fact that an absolute prohibition on the use of reproductive cells after the death of the donor may violate the will of the deceased partner or spouse.\textsuperscript{11} In this regard, consideration could be given to the permissibility of using sperm donated for partner donation in the event that the man makes an appropriate declaration pro futuro.\textsuperscript{12} This possibility should, however, be subject to time limits within which such a procedure could be performed.\textsuperscript{13} A significant number of countries have opted for such a solution, where the use of gametes from the deceased collected during his lifetime is permitted under certain time limits.\textsuperscript{14}

Another issue to be addressed is postmortem embryo transfer. Article 33 of the F.T.A. permits the continuation of the procedure and the transfer through partner donation into a woman’s uterus of an embryo created earlier from her reproductive cells and the donor’s cells after the female donor’s death. Note should also be taken of the legislator’s omission of a clear timeframe for the transfer of any such embryo. A woman may use such an embryo within

\textsuperscript{10} E. Wojewoda, Prawnokarne i kryminologiczne aspekty medycznie wspomaganej prokreacji, Białystok 2019, p. 173.

\textsuperscript{11} A. Niżnik-Mucha, Prawna regulacja medycznie wspomaganej prokreacji w Polsce i wybranych państwach europejskich. Wybrane problemy, Kraków 2016, p. 183.


\textsuperscript{13} E. Wojewoda, op.cit., p. 174.

\textsuperscript{14} See more broadly M. Marszelewski, Zapłodnienie post mortem w europejskim prawie porównawczym. Przyczynek do oceny polskiej ustawy o leczeniu nieплодności, “Prawo i Medycyna” 2015, No. 4, p. 110; idem, Zapłodnienie post mortem w wybranych krajach, pp. 165–196.
its storage time limits, which arise from the embryo storage contract concluded with a germ cell and embryo bank, as set out in Article 46 of the F.T.A. However, the banking period may not exceed 20 years, after which the embryo is transferred to embryo donation (Article 21(3)(1) of the F.T.A.). Thus, this represents quite a long period of time, the expiry of which may generate numerous issues with regard to inheritance.\footnote{See more broadly: M. Nesterowicz, Problemy prawne nowych technik sztucznego poczęcia dziecka, “Państwo i Prawo” 1985, No. 2, pp. 47–48; M. Safjan, Prawo wobec ingerencji w naturę ludzkiej prokreacji, Warszawa 1990, pp. 38–39.} De lege ferenda, it seems that it would be rational to indicate time limits for embryo-transfer.

The provision of the possibility of using the thus-created embryo is itself legitimate, although its formula seems to be highly flawed. Therefore, it is necessary to address some rather important doubts that may accompany such a disposition. Since the present application of the right is granted to a single woman, one may immediately note that the legislator is inconsistent in this respect, for example on the grounds of the Polish law, one of the general principles is the limitation to married couples and cohabiting heterosexual couples of the circle of subjects who may use the procedures of medically assisted procreation.

It should also be taken into account that the legislator has made a diametrical distinction between the situation of the woman and the embryo in the case of homologous and heterologous donation, i.e., where there is ‘foreign’ genetic material – a gamete from an anonymous female or male donor. A woman is not allowed to opt for the transfer of an embryo created from her ova and the sperm of an anonymous donor, from the ova of an anonymous donor and the sperm of her partner/husband, or from male and female gametes from anonymous donors. It seems particularly controversial that the woman can be prevented from transferring an embryo that was created from her own oocyte. It is difficult to find a rational justification for such an arbitrary decision, which clearly undermines the patient’s autonomy of decision in the reproductive sphere. It is impossible to ignore the fact that knowing that such an embryo...
Some remarks on the criminal law aspects of the postmortal use...

A man entering into an infertility treatment procedure at no stage expressly gives his separate consent to a possible embryo transfer in the event of his death. Pursuant to Article 29 of the F.T.A. in conjunction with Article 17 of the F.T.A., the donor consents to the fusion of the retrieved gametes and their use. One may assume that his consent is also covered by the possible postmortem implantation of an embryo that was created using his sperm. However, it is pointed out that such a man may not be aware of this fact, as the scope of the doctor’s duty of information does not take account of it. Furthermore, it is hardly possible to assume that all patients starting infertility treatment will be legally aware of the far-reaching consequences of commencing the procedure. Kinga Bączyk-Rozwadowska points out that it is therefore incumbent on the donor to make such determinations on his/her own by exercising the right to inquire (Article 29(1)(3b), Article 32(2)(4b) of the F.T.A.), in order for that person to understand fully the consequences of the postmortem embryo transfer. The said author notes that only then will the person be able to make a fully informed decision in this regard. Any other solution could give rise to doubts as to respect for the donor’s procreative autonomy, as well as to the risk of execution of selfish motives on the part of the partner, which could contravene the principle of the good of the child.

On the other hand, the opposite situation, namely the use of an embryo in the event of the death of the donor of the ovum from which it was formed, is not explicitly addressed in the F.T.A. In the light of Article 78 of the F.T.A. in conjunction with Article 20 of the F.T.A., it can be conceded as implicit that the transfer of an embryo

---

16 On the concerns related to the lack of full information on the possible directions for the disposal of genetic material, see more broadly: M. Boratyńska, J. Różyńska, op.cit., p. 386.

into the body of a new partner of the man is not permissible. Thus, such an embryo is banked until the expiration of the time indicated in the storage contract, since the woman’s consent to place it for adoption can no longer be obtained. *De lege lata*, the situation of male donors of genetic material differs fundamentally from that of female donors. This is because the man has no influence over the fate of the embryo created with his sperm. This can also be seen as a manifestation of the limitation of the protection of embryos created under laboratory conditions in the national legal order.

On the other hand, in the case of the death of both donors of germ cells, the embryo that resulted from them is transferred for adoption (Article 21(3)(2) of the F.T.A.). It should be noted, however, that once again no reference is made at the statutory level to the designation of tools to enable the germ cell and embryo bank to obtain information about the death of donors, whereas on the grounds of the F.T.A., postmortem initiation of a medically assisted procreation procedure is strictly impermissible. Article 24 of the F.T.A. emphasizes that it is unacceptable to collect reproductive cells from human cadavers for use in a medically assisted procreation procedure.

3. Criminal law provisions of the F.T.A. on the postmortem use of medically assisted procreation techniques

As regards the criminal law aspect of the infertility treatment act, it is possible to identify two provisions which relate to the sanctioning of prohibitions on the postmortem use of medically assisted procreation techniques. First of all, consideration should be given to Article 78 of the F.T.A. which criminalizes the handling of reproductive cells or embryos in a manner contrary to the requirements set out in the said act. The provision in question safeguards the correct course of procedures relating to the handling of germ cells and embryos, which are defined in detail in the F.T.A. Its main objective is to ensure safety in the area of infer-
tility treatment using medically assisted procreation techniques. Indeed, the use of the ART procedures may pose a threat to the health and even the life of the persons undergoing the procedure, as well as to the proper development of embryos created under extracorporeal conditions. In the context of the considerations presented in this paper, however, attention should also be paid to the protection of the procreative autonomy of the individual – the freedom to decide whether or not to take part in the procedure, which is to be guaranteed by the need to obtain the consent of the donors and recipients as well as the consideration of the withdrawal of this consent.  

The criminalized offence consists in acting in a manner inconsistent with Articles 18, 20–22 or 23(1) of the F.T.A. In the context of the considerations presented above, it is important to fulfill the negative premises preventing the use of germ cells collected from the donor in the procedure of medically assisted procreation, which have been listed in Article 18 of the F.T.A. One of such conditions is in fact the death of the donor from whom gametes have been collected for the purpose of partner donation (Article 18(1)(2) of the F.T.A.). Such a measure renders it impossible for the surviving partner to continue the parenting project initiated earlier together with her partner. The surviving partner cannot undergo insemination with such sperm, nor can she decide to carry out in vitro fertilization using it and a subsequent embryo transfer.

In addition, the criminalization of this provision also extends to the postmortem transfer of embryos created during the lifetime of a deceased woman from her reproductive cells into the body of the new partner of her previous partner. Such conduct may violate Article 20 of the F.T.A., given her lack of *ex ante* consent to the transfer of the embryo. It is also worth noting that, pursuant to Article 20(3) of the F.T.A., in the case of prior cryopreservation of embryos created from germ cells for the purpose of partner donation, the legislator requires that consent be given each time before the procedure is restarted, which cannot be done in the case of the

---

18 E. Wojewoda, op. cit., p. 303.
death of the donor of an egg cell. The offence under Article 78 of the F.T.A. is of a general nature, whereas on the subjective side, it is characterized by intentionality, in both forms of the intent. The penalty for handling reproductive cells and embryos in contravention of the above mentioned provisions is a fine, restriction of freedom, or imprisonment for up to one year. However, it should also be noted that at the level of the Polish Code of Penal Procedure, surrogate motherhood of a commercial nature is also penalized; pursuant to Article 211a(2) and (3) of the Penal Code, it is an offence punishable by imprisonment of between 3 months and 5 years.

In Article 84 of the F.T.A., the legislator has specified the extraction of reproductive cells from a corpse for use in a medically assisted procreation procedure. The norm stemming from this provision is in conjunction with the norm from Article 24 of the F.T.A. The purpose of this provision is to ensure respect for human remains. Additionally, it protects the general feeling of piety, as well as the welfare of the child to be born as a result of a medically assisted reproduction procedure. One cannot disregard the fact that information about the details of the child’s origin could have a very negative impact on the child’s future functioning.

The criminalized act consists in the taking of reproductive cells from human cadavers for the purpose of using them in a medically assisted procreation procedure. The act of collecting reproductive cells consists in undertaking actions resulting in obtaining reproductive cells (Article 2(1)(19) of the F.T.A.). Oocytes are collected by means of ovarian puncture, while spermatozoa are collected as a result of a biopsy of the testis or epididymis.

The object of execution to which the typified conduct relates is a corpse. The term corpse refers to the bodies of deceased persons and stillborn children. They are presumed to constitute ‘dep-

---

21 E. Wojewoda, op. cit., p. 325.
personalized human remains’ and therefore must be regulated in a special way. For this reason, the status of a corpse has not been equated with that of a physical object, and, consequently, it cannot be the subject of trade.\(^23\) It should be highlighted that, from the perspective of criminal liability, any subsequent insemination with sperm harvested from a corpse or the creation of an embryo from gametes harvested from a corpse are irrelevant. The criminalization extends to the act of collection itself – the undertaking of actions leading to the acquisition of gametes, which is therefore a non-consequential offence.\(^24\)

It appears that the analyzed offence is a one that can be perpetrated universally. However, one may wonder whether the explicit specification of the purpose of the perpetrator’s action in the content of the provision will not lead to limitation of the spectrum of addressees of this norm. Given the fact that the legislator indicates the necessity to aim at using the gametes taken from the corpse in the procedure of medically assisted procreation, one may have doubts whether this behaviour may *de facto* be committed by anyone or only by an entity whose actions are carried out within the scope of activities of an infertility treatment center holding the relevant permits.\(^25\) In her analysis of this issue, Katarzyna Nazar observes that in practice there may be cases in which the extraction of gametes from a corpse takes place in an infertility treatment centre, which does not have the relevant permits. Consequently, such a procedure would not fall within the scope of medically assisted procreation procedures, even though the act itself could be performed by a person with the requisite knowledge and competence in this area. Moreover, it is also possible to envisage situations in which the criminalized causal act is performed by an individual who does not have any formal qualification to perform medically assisted procreation procedures, but does so for the purpose specified in the provision, even if this falls outside the statutory frame-

\(^{23}\) J. Haberko, op.cit., p. 391.
\(^{24}\) E. Wojewoda, op.cit., p. 327.
\(^{25}\) J. Haberko, op.cit., p. 393.
work of a medically assisted procreation procedures.\textsuperscript{26} \textit{De lege ferenda}, this provision should therefore be drafted in a manner that clearly eliminates such doubts.

It is an intentional offence that can only be committed with direct intent (\textit{dolus directus coloratus}). The law clearly indicates the purpose of using reproductive cells taken from a corpse in a medically assisted procreation procedure. However, the question arises at this point as to whether the narrowing of the scope of the purpose resulting from the literal wording of the provision means that the postmortem collection of reproductive cells for a purpose other than that expressly indicated falls outside the scope of criminalization. In this context, it is necessary to refer to the content of Article 17 of the F.T.A., which defines the application of germ cells in a medically assisted procreation procedure. Accordingly, it concerns the transfer of male germ cells into the recipient’s organism, the extracorporeal creation of an embryo, the testing of germ cells and embryos and the transfer of created embryos into the recipient’s organism. Compilation of these provisions indicates that under the F.T.A. the criminalization does not extend to the removal of reproductive cells from a corpse for scientific or teaching purposes. It should be noted that in such a case, the provisions of the Transplantation Act also cannot be applied to the assessment of such conduct. \textit{De lege lata}, the provisions of the Transplantation Act\textsuperscript{27} do not regulate the harvesting and transplantation of reproductive cells, gonads, embryonic and foetal tissues, and reproductive organs or parts thereof, as is clear from Article 1(2)(1) of the T.A.\textsuperscript{28} Such a solution appears to be an oversight on the part of the legislator. Joanna Haberko\textsuperscript{29} underscores that the conduct in question is, after all, contrary to the

\textsuperscript{26} Ibidem; K. Nazar, op.cit., p. 189.

\textsuperscript{27} Consolidated text: Journal of Laws of 2023 item 1185, further referred to as: T.A.


provisions of the Directive of the European Parliament and of the Council on setting standards of quality and safety for the donation, procurement, testing, processing, preservation, storage, and distribution of human tissues and cells.\textsuperscript{30}

Teresa Gardocka argued that proving the purpose of the perpetrator's action in a potential criminal trial could pose significant problems. At the same time, she pointed out that consideration should be given to the question of whether there exists any permitted purpose for collecting gametes from a corpse, and if not, the reference to the purpose in the F.T.A. should be regarded as irrelevant.\textsuperscript{31} The least doubts arise in the case of an act of donation of germ cells during one's lifetime, in which a given person allocates them for scientific purposes, although even in such a case, depending on the circumstances of a given state of facts, it will be possible to ascribe to the perpetrator the fulfillment of the statutory criteria of Article 262(1) of the Penal Code.\textsuperscript{32} Committing the offence in question is punishable by imprisonment from 6 months to 5 years.

4. Conclusion

The provisions of the Infertility Treatment Act allow the postmortem use of medically assisted procreation techniques within rather narrow limits. Primarily, it is not possible to collect gametes from a corpse, nor is it possible to use postmortem reproductive cells collected while the donor was still alive for insemination or extracorporeal embryo formation. However, it seems that an absolute prohibition on the use of reproductive cells following the death of the donor may violate the autonomy of the deceased partner/spouse in the reproductive sphere. In this regard, consideration could be given to the permissibility of the use of sperm do-

\footnote{30 Official Journal of the EC L 102 of 7/04/2004, p. 48–58.}
\footnote{32 K. Nazar, op.cit., p. 187.}
nated for partner donation in the event that the man makes an appropriate *pro futuro* declaration with specific time limits for the use of frozen sperm.

The national legislator has decided, as an exception, to allow the postmortem transfer of an embryo, created through a partner donation, in the event of the donor’s death. However, it should be noted that this solution allows the continuation of the parental project exclusively to the woman and only in the event of homologous donation. For unjustified reasons, the woman is generally excluded from deciding on the use of an embryo created from her ovum and sperm from an anonymous donor, which can only unnecessarily compound the negative consequences for the psyche of a woman who is already facing the suffering caused by the loss of her husband/partner. It should be borne in mind that the admissibility of embryo transfer after the death of a man may not, however, be subject to his consent, as he may, for various reasons, oppose the birth of a child after his death, hence the importance of properly informing the donor of the legal consequences of sperm donation for partner donation and of considering the admissibility of an objection *pro futuro* to the use of an embryo after death. In addition, attention should be drawn to the fundamental difference that exists in the event of the death of the woman from whose ovum an embryo has been created through partner donation. In fact, the surviving partner has no influence on the embryo’s subsequent fate. The utilization of the embryo is suspended, so to speak, in a vacuum. The embryo is cryopreserved until the time limits of the storage contract expire, and only then can it be placed for adoption. Although the time limits for cryopreservation are repeatedly exceeded and even embryos that have been frozen for many years can be used to induce a pregnancy that ends in the birth of a healthy child, it must be stressed that prolonged hibernation can have a negative impact on the embryo’s ability to develop properly. This situation raises doubts as to the actual implementation of the protection of the embryo, which, after all, guided the legislator in creating the numerous solutions contained in the F.T.A.
It is also impossible not to notice that, on a statutory level, the question has been overlooked of developing mechanisms that would allow germ cell and embryo banks to obtain information about the death of patients, which itself has far-reaching consequences in the area of the possibility of using the deposited genetic material and embryos.

The prohibition of collecting reproductive cells from cadavers deserves approval, but the indication of the restriction of the subjective side – the purpose for which this is to be carried out – is open to criticism. The literal wording of the provision implies that it is permissible to collect gametes from cadavers, e.g., for educational or didactic purposes. It should not be overlooked that in practice it will be very difficult to prove that one acts with a specific intent when collecting gametes from cadavers. *De lege lata*, Article 84 of the F.T.A. as it stands does not uphold full respect for the corpse, leaving outside the field of criminalization the execution of this conduct for a purpose other than that expressly indicated therein. Moreover, the construction of Article 84 of the F.T.A. raises doubts as to whether it constitutes a universal or an individual crime. Such ambiguities in criminal law provisions are highly undesirable. It seems that despite such a wording of the provision, the legislator’s intention was not at all to limit the circle of addressees of Article 84 of the Act solely to entities participating in the procedure of medically assisted procreation, which may be carried out only in specialized establishments holding the appropriate licences to conduct the said activity. Such a state of affairs results in a fundamental interpretation gap, which may allow persons who undertake actions for a specific purpose outside the statutory framework of the medically assisted procreation procedure, e.g., in entities whose authorization has expired, to avoid responsibility on the criminal level.
SUMMARY

Some remarks on the criminal law aspects of the postmortal use of medically assisted procreation techniques on the grounds of the law on infertility treatment

Medically assisted procreation techniques, including in vitro fertilization, are standard medical procedures used to treat infertility. Their evolution has also created many new challenges for legislators. One of the problems is the possibility of giving birth to a child postmortem. In the study, the issues of postmortem fertilization, embryo transfer post mortem, as well as the collection of gametes from cadavers for use in the procedure of medically assisted procreation were analyzed in the light of the provisions of the Law on Infertility Treatment. Additionally, an attempt has been made to evaluate them and point out inaccuracies that their interpretation may raise.

Keywords: medically assisted procreation; in vitro fertilization; collection of reproductive cells from cadavers; postmortem fertilization; postmortem insemination

STRESZCZENIE

Kilka uwag na temat prawnokarnych aspektów postmortalnego stosowania technik medycznie wspomaganej prokreacji na gruncie ustawy o leczeniu niepłodności

Techniki medycznie wspomaganej prokreacji, w tym zapłodnienie pozaustrójowe, stanowią standardowe procedury medyczne stosowane w leczeniu niepłodności. Ich rozwój stworzył jednak także wiele nowych wyzwań stojących przed ustawodawcą. Jednym z problemów jest właśnie możliwość powołania na świat dziecka post mortem. W pracy analizie poddano problematykę zapłodnienia postmortalnego, transferu zarodka post mortem, jak również pobierania gamet ze zwłok w celu zastosowania w procedurze medycznie wspomaganej prokreacji w świetle przepisów penalnych ustawy o leczeniu niepłodności. Podjęto też próbę dokonania ich oceny i wskazania nieścisłości, które może wzbudzać ich interpretacja.

Słowa kluczowe: metody medycznie wspomaganej prokreacji; zapłodnienie in vitro; pobieranie komórek rozrodczych ze zwłok; zapłodnienie post mortem; inseminacja post mortem
BIBLIOGRAPHY


