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## **The Criminal Liability for Human Actions Involving Stem Cells in Jordan: A Comparative Law Study**

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**Abstract:** This study clarified the criminal liability for the disposal of human stem cells according to Jordanian legislation compared to Indonesian legislation, depending on the type of this disposal, whether by way of sale or by way of donation. Hence, the researcher followed the descriptive and analytical approach to present the texts criminalizing the disposal of stem cells and analyze their content to determine the scope and limits of criminal liability for this disposal to prevent the misuse of stem cells for material gain. The study revealed a set of conclusions, which consisted of criminalizing the disposal of stem cells in exchange for financial compensation and permitting such disposal if it is by way of donation, with the possibility for the donor to receive simple compensation that does not rise to the level of the financial compensation for these cells, provided that informed consent to the donation is given. The transfer of stem cells to another body does not harm public health. The Jordanian legislature recommends that some amendments be made to the elements criminalizing the disposal of stem cells, depending on the degree of risk it poses to the mere sale or trafficking, as reflected in the number of penalties prescribed for each criminal case in a manner commensurate with the criminal gravity.

**Keywords:** Criminal Law, human organs, human trafficking, stem cells, comparative law, Jordan

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**Abstrak:** *Studi ini mengklarifikasi tanggung jawab pidana untuk pembuangan sel punca manusia menurut undang-undang Yordania, tergantung pada jenis pembuangan tersebut, baik melalui penjualan maupun melalui sumbangan. Oleh karena itu, peneliti dalam studi ini mengadopsi pendekatan deskriptif dan analitis untuk menyajikan teks-teks yang mengkriminalisasi pembuangan sel punca dan menganalisis isinya untuk menentukan cakupan dan batasan tanggung jawab pidana untuk pembuangan ini guna mencegah penyalahgunaan sel punca untuk keuntungan materi. Studi ini mencapai sejumlah kesimpulan, yang terdiri dari mengkriminalisasi pembuangan sel punca sebagai imbalan kompensasi keuangan dan memperbolehkan pembuangan tersebut jika dilakukan melalui sumbangan, dengan kemungkinan bagi pemberi sumbangan untuk menerima kompensasi sederhana yang tidak mencapai tingkat kompensasi keuangan untuk sel-sel ini, asalkan diberikan persetujuan yang diinformasikan terhadap sumbangan tersebut. Transfer sel punca ke tubuh lain tidak membahayakan kesehatan masyarakat Legislatif Yordania merekomendasikan dilakukannya beberapa perubahan pada unsur-unsur yang mengkriminalisasi pembuangan sel punca, tergantung pada tingkat risiko yang ditimbulkannya terhadap penjualan atau peredaran sel tersebut, sebagaimana tercermin dalam jumlah hukuman yang ditetapkan untuk setiap kasus pidana secara sebanding dengan tingkat kejahatan yang dilakukan.*

**Kata Kunci:** *Hukum pidana, organ manusia, perdagangan manusia, sel punca, perbandingan hukum, Yordania*

## Introduction

Stem cells are a natural source of fresh cells that the human body may require to replace ailing or damaged cells. Because of this, scientists now view stem cells as a fascinating treatment for all diseases. For many patients who previously had no therapeutic options, they have provided a new ray of hope. Because they can use healthy cells from another source, stem cells can repair and regenerate diseased or damaged organs.<sup>1</sup>

The discovery of stem cells has sparked the curiosity of scientists and researchers worldwide, including in Jordan, and opened up new therapeutic possibilities. Jordan has consistently pushed for necessary measures to protect human-derived stem cells for medical or academic study. As a result of the Jordanian government's acknowledgment of the significance of creating legal frameworks for stem cell usage and donation, the Stem Cell System No. (10) of 2014 was released.

This legal system permits the donation of stem cells for use in medical procedures and research. However, under the threat of legal action, the law firmly

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<sup>1</sup> Daoud Abdelkader, et.al., "Testing organ-specific responses to therapies in tissues differentiated from Cystic Fibrosis patient derived iPSCs," *Stem Cells Research* 83, (2025).

prohibits the sale and transfer of stem cells.<sup>2</sup> On the other hand, Indonesian government issued several regulations relating to stem cells. The latest was Regulation No. 62 of 2013 concerning the Management of Bank of Tissues and/or Cells, and No. 32 of 2018 concerning the management of Stem Cells and/or Cells Services. The Public Health Law and the Law on Utilization of Human Body Organs, which treat stem cells as organs under the law, govern the criminal responsibility clauses relating to the arrangement of stem cells. This is because dealing with people to use their organs is illegal and penalized by law under the Anti-Trafficking in Persons Act.<sup>3</sup>

The Jordanian criminal legislator has tried to make a security system that defends human stem cells from human exploitation, banning any harm to stem cells and their complete disposal. This guarantees they are not aiming for commercial transactions, buying and selling, or becoming a way for the wealthy and investors to bargain using their money without responsibility. While the objectives of health laws development in Indonesia is to raise everyone's awareness, will, and ability to live healthy in order to realize the highest degree of public health as an investment for developing productive human resources socially and economically.<sup>4</sup>

According to Jordanian legislation, research on the criminal liability for human disposal of stem cells requires dividing this disposal into two types. The first is related to the sale of human stem cells through an in-depth reading of the provisions of the Law on the Use of Human Body Organs and the Stem Cell System. In contrast, the second type of this disposal is related to the donation of human stem cells, addressing the limits of permitting human donation of stem cells in exchange for compensation and the restrictions on this donation under the risk of criminalization and punishment.

Various studies related to cells that have been conducted by researchers can be used as material in this article. For example, Majali dealt with the legal conditions for the transfer of human organs in a legal manner, the elements and elements of the crime of transferring human organs as a crime of trafficking in persons and the penalties prescribed for it, and the study concluded with several findings and recommendations, the most important of which are: Adding the term irregular transfer of human organs to the Trafficking in Persons Law, and referring the elements of the crime of organ removal stipulated in the Trafficking

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<sup>2</sup> Daoud Abdelkader and Jorge O Múnera, Insights into Human Development and Disease from Human Pluripotent Stem Cell Derived Intestinal Organoids *Front. Medicine. (Lausanne)*, 6 (2019). Stem Cell System No. (10) of 2014.

<sup>3</sup> Ali Qtaishat, Interpretation of Micro-Organism under The TRIPS Agreement, *Business Law Revue* 4, (2014), p. 140–147.

<sup>4</sup> Nur Iffatin, "Stem Cell Therapy Its Legality in the perspectives of Indonesian Law and progressive Islamic Jurisprudence," *International Journal of Advanced Research* 8, No. 2 (2020). p. 207.

in Persons Law to the Human Organ Donation Law to determine the aspects and elements of the crime of transferring human organs as a crime of trafficking in persons.<sup>5</sup>

Bin Issa dealt with human organ transplantation, shedding light on organic therapeutic human cloning and stem cell therapy as scientific developments that have entered the field of application to enhance the chances of successful human organ transplantation, enrich the means of practicing it, and clarifying its legal ruling. The study concluded that scientists have sought to enrich the sources of human organs through cloning and stem cells and that the legal ruling on these therapeutic alternatives is in detail, not in total, and that their use is subject and linked to a scrutinizing legal stand that determines what is legitimate and permits it, and determines what is prohibited and prevents it.<sup>6</sup>

Ifattin scanned a set of library research regarding stem cells therapy from the perspectives of Indonesian law and progressive *fiqh* (Islamic jurisprudence). He indicated that Stem cell therapy presents an innovative medical intervention that can fix the damages on the human body by repairing, replacing, restoring, and regenerating the damaged tissue and organs (so called regenerative medicine) without surgery. It has been undergoing an axiological and revolutionary progress both in medical treatments (treatments for degenerative diseases, genetic disorders, damages or death of nerves and tissues / necrosis) and preventive actions such as aging prevention and reverse aging treatments. Ifattin concluded that according to the Indonesian law and the Islamic progressive *fiqh*, the stem cell therapy for the treatment of degenerative diseases, genetic disorders and tissue damages or for reverse aging treatment using the cells that come from oneself (autologous) and from other people (allogeneic) is permissible, whereas if the cells come from embryonic cells, animals (xenogeneic) or plants, the Indonesian Law prohibits it while the Islamic progressive *fiqh* deems it permissible under strict conditions.<sup>7</sup>

Michalis's study concerned a person's right to dispose of his bodily organs and the legal nature of this disposition and its controls. The study concluded that a person has the right to dispose of his bodily organs by utilization and utilization, without conducting any commercial transaction in the processes of transferring

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<sup>5</sup> Al-Majali, Transplantation of Human Organs As A Crime of Trafficking in Persons: An Analytical Study in the Saudi System, *Institute of Public Administration*, 63, No. 4 (2023), p. 791-825.

<sup>6</sup> Rashida Bin Issa, Scientific Developments of Human Organ Transplantation in The Light of Islamic Law: Organic Cloning and Stem Cells as A Model, *Journal of Prince Abdelkader University of Islamic Sciences*, 35, No. 1 (2021), p. 367–409.

<sup>7</sup>Nur Iffatin, "Stem Cell Therapy Its Legality in the perspectives of Indonesian Law.

and transplanting these organs, to protect the body while setting controls that restrict the process of disposing of the person's bodily organs<sup>8</sup>.

Farfaq dealt with the Protocol to Prevent, Suppress, and Punish Trafficking in Persons, Especially Women and Children, supplementing the United Nations Convention against Transnational Organized Crime. The study concluded that Algeria is on the list of countries that believed in most of the content of this protocol and ratified it with a reservation. This ratification was a prelude to amending the Algerian Penal Code, which criminalized trafficking in human organs by monitoring the acts of trafficking in human organs or extracting them without the consent of their owner to protect the body; it criminalized the attempt to commit this crime and prevent the application of mitigating circumstances, in addition to criminalizing the failure to report human trafficking crimes upon knowledge of them.<sup>9</sup>

The medical revolution with the emergence of stem cell therapy was accompanied by a moral storm in the whole world, which created a severe crisis against humanity that is one of the biggest challenges, including the exploitation of human stem cells for material gain, which prompted the Jordanian legislator to seek to create a legislative system that preserves human stem cells from human greed, especially since criminal legislation at the national and international level criminalizes the sale and trade of human organs without finding special criminal provisions that directly criminalize the disposal of stem cells. Criminal legislation at the national and international levels criminalizes the sale and trade of human organs without finding special criminal provisions that directly criminalize the disposal of stem cells, which raises the question of the scope of criminal responsibility for the disposal of human stem cells in light of the medical and penal laws in Jordanian legislation.

The research question regarding criminal liability for disposal of human stem cells arises from a series of main questions namely how is criminal liability for human actions involving stem cells according to Jordanian law. Therefore, the study aims to explain about establishing the legal meaning, the use of organs against stem cells as a subject of criminal liability. Detecting the scope of criminal liability, determining the limitations of the permissibility of stem cell donation in exchange for compensation for damages, costs, and risk coverage, as well as explaining the legal requirements required to donate stem cells in order to prevent criminal liability.

To fulfill the intended purpose of the study and to answer its questions, the researcher followed the descriptive and analytical approach by describing the legal texts that criminalize human disposal of stem cells according to Jordanian

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<sup>8</sup> Z. Michali, "The right of a person to dispose of his bodily organs, *Journal of Human Rights and Public Freedoms* 4, (2017), p. 143-120.

<sup>9</sup>M. Farfaq, "Crimes of Trafficking in Human Organs in the Algerian Penal Code," *Academy Journal of Social and Human Studies* 10, (2013). p. 129-137.

health and penal legislation, in addition to analyzing the content of these texts, defining their scope, conditions of application and the penalty for violating them, and pointing out the shortcomings or flaws in the legal regulation to protect stem cells from human greed, whether the stem cell disposal is for pure sale or trade. In addition to depend on comparative approach to compare how both Indonesian and Jordanian legislator handled the stem cell issue.

### **Stem Cells Are Considered a Member of The Human Body in The Legal Sense**

According to the National Library of Medicine, stem cells are a type of biological cell described by their talent to distinguish and transform into several specialized cell types in the body.<sup>10</sup> These cells function as an essential basis for tissue and organ renewal and recreation. Stem cells can be found in many body parts, such as bone marrow, embryonic tissues, and adipose tissue.

From a biological point of view, stem cells are not differentiated and specialized cells that have the power, under particular circumstances, to suffer division and differentiate into specialized cells, prompting the creation of tissues and organs in the human body<sup>11</sup>. Human stem cells ceaselessly rebuild within the body and can differentiate into cells that form the basis of all body tissues, organs, and immune systems<sup>12</sup>.

From the biological view of stem cells, it can be noticed that they are the building blocks or the base for the construction of an organ of the human body instead of the organ itself.<sup>13</sup> The physical organ planned to be built from stem cells has not yet been shaped. This shows that stem cells are not measured human body organs within the scientific or biological concept.<sup>14</sup>

An organ, in law, is "any organ of the human body or part thereof"<sup>15</sup>. According to this definition, it is necessary to reevaluate the degree to which stem cells are regarded as constituents of the human body or its organs and to apply the

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<sup>10</sup> David Wu, et.al., Generation of Induced Pluripotent Stem Cell Line from a Patient with Long COVID, *Stem Cells Research*, (83), (2025).

<sup>11</sup> Jordanian et al. Law: Article 2.

<sup>12</sup> Iman Mukhtar Al-Mustafa, *Stem Cells and Their Impact on Medical and Surgical Procedures from an Islamic Perspective*. 1st edition, Egypt: Al-Wafa Legal Library, (2012).

<sup>13</sup> Ryan Dexheimer, et.al., Generation of two iPSC lines from dilated cardiomyopathy patients with pathogenic variants in the SCN5A gene. *Stem Cell Res.* 80, (2024).

<sup>14</sup> Amit Manhas, et.al., "Generation of two iPSC lines from vascular Ehlers-Danlos Syndrome (vEDS) Patients Carrying a Missense Mutation in COL3A1 gene. *Stem Cell Res.* 79. (2024).

<sup>15</sup> Jordanian Law on Utilization of Human Body Organs: Article 2.

laws governing the use of human body parts to any conduct in which a person refers to their stem cells.<sup>16</sup>

Therefore, it is critical to distinguish between the two primary categories of stem cells: adult and embryonic.

1. Embryonic Stem Cells (ESCs) are stem cells extracted from embryos or embryonic tissues. Human embryos typically comprise 50-150 cells when they obtain the blastocyst stage, which happens around 4-5 days after fertilization<sup>17</sup>. ESCs are derived from the inner cell mass of the blastocyst. In any event, this type of stem cell is nothing more than cells or tissues that make up the embryo. The proposed organ, as referred to in the Law on Utilization of Human Body Organs, has not yet been shaped. The law belongs to existing and fully enhanced organs or parts thereof rather than the cells that form the organ.<sup>18</sup>
2. Adult stem cells (ASCs) are found in adult humans' or children's tissues or organs. Examples include stem cells obtained from the spinal cord, umbilical cord blood, mesenchymal stem cells<sup>19</sup>, adipose-derived stem cells, and dental pulp stem cells.<sup>20</sup>

According to the study, adult stem cells are removed from a human bodily part like the spinal cord. These cells, often referred to as adult stem cells, are regarded as a component of a functioning organ in the human body. An organ is defined in Article 2 of the Organ Utilization Law as "any organ of the human body or part thereof." As a result, the adult stem cell procured for the organ is regarded legally as a component of that organ and the human body.<sup>21</sup>

However, despite what was mentioned before, the stem cell is not a part of a specialized cell as it is not separated or extracted from a specialized cell. In place of this, stem cells coexist alongside specialized cells, albeit in smaller numbers. Therefore, stem and specialized cells are considered sections of the human body.<sup>22</sup> In Islamic law, we find that Islam does not prohibit the cultivation

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<sup>16</sup> Nazish Sayed, et.al., "Translation of Human-Induced Pluripotent Stem Cells: From Clinical Trial in A Dish to Precision Medicine," *J. Am. Coll Cardiol* 67, No. 18 (2016), p. 2161–2176.

<sup>17</sup> Nazish Sayed, et.al., Clinical Trial in a Dish Using iPSCs Shows Lovastatin Improves Endothelial Dysfunction and Cellular Cross-Talk in LMNA Cardiomyopathy. *Sci Transl Med.* 12 (554). (2020).

<sup>18</sup> Hongxiang Hui, et.al., *Stem Cells: General Features and Characteristics*, US- Los Angeles: University of California (2011).

<sup>19</sup> Atmiya Nayak, et.al., "Function of Stem Cells and Their Future Roles in Healthcare", *International Journal of Pharma. Research and Review* 3, No. 5 (2014).

<sup>20</sup> Hongxiang Hui, et.al., *Stem Cells*, p. 5-8.

<sup>21</sup> D. Thomas, D., et.al., CCL2-Mediated Endothelial Injury Drives Cardiac Dysfunction in Long COVID. *Nat. Cardiovasc. Res.* 3, No. 10 (2024), p. 1249–1265.

<sup>22</sup> Rani Al-Rahahleh, *Civil Liability of Stem Cell Banks in Jordanian Legislation*. Doctoral Thesis, Al-Albayt University/Amman, Jordan (2022).

of stem cells and genes, but within the limits of the law, without transgression and based on conditions; especially since this is a modern matter and there is no text in the Holy Qur'an or the Noble Prophetic Sunnah prohibiting it. Rather, scholars have worked hard to establish governing controls that regulate this issue, and to use analogy in what there is no explicit text for, and to use similar texts.<sup>23</sup>

The Islamic jurisprudence community has identified the sources that must be relied upon in cultivating and extracting stem cells to be used in treatment, explaining the prohibition of some points in this issue in order to preserve lineages and protect human rights, and to prevent trade in this issue, and stating the legal limits and controls that must be adhered to if they are resorted to in treatment.

Accordingly, there is no harm in stem cell therapy according to Islamic law, as it falls under the principle of the legitimacy of treatment in Islamic law. However, the disagreement lies in the methods of obtaining these cells for their therapeutic uses. Some of these methods are agreed upon as being valid, while others are disputed, and some are not permissible according to Islamic law. The legal rulings for each method have been explained, with mention of the evidence and opinions of the jurists, and discussion of these opinions, with preference in accordance with the general rules of Islamic law, which came to encourage treatment to achieve the interest and remove hardship from those obligated.<sup>24</sup>

In light of the explanation of the text of Article 2 in the definition of an organ, adult stem cells, at large, are considered human organs, just like other organs of the human body. The phrase implies this "or part thereof" indicated in the definition of the Organ Utilization Law, even if it refers back to the human body rather than the specific organ. Therefore, the stem cell is unquestionably a part of the human body and not split from it.

Based on the elucidation of Article 2 of the Jordanian Organ Donation Law, it suggests that the provisions of criminal liability and punishment concerning the transplantation of human organs from the human body implement to the actions of a person with their stem cells. Hence, the Jordanian Organ Donation Law can be applied to stem cells, under the control of a person's actions

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<sup>23</sup> Azhar, Islamic Law Reform in Indonesia from the Perspective of Maqāṣid Al-Sharī'ah: Kerinci's Intellectual Views, *Samarah: Jurnal Hukum Keluarga dan Hukum Islam*, 8, No. 2 (2024).

<sup>24</sup> Decision of the Jordanian Fatwa Council No. (35) dated 12/23/1413 AH corresponding to 6/13/1993 AD, Fatwas of the Fatwa Sector in Kuwait (2/188), Fatwa No. (651, 652), Fatwas of the Permanent Committee (21/443, 431, 438), Decisions of the Jordanian Fatwa Council No. (35) dated 12/23/1413 AH corresponding to 6/13/1993 AD, Decisions of the Islamic Fiqh Council affiliated with the Muslim World League in its twelfth session held in Makkah Al-Mukarramah during the period from Saturday 15 Rajab 1410 AH corresponding to February 10, 1220 AD to Saturday 22 Rajab 1410 AH corresponding to February 17, 1990 AD, Permanent Committee (21/452).



with their stem cells, as a means of criminal responsibility and punishment, referring to the transplantation of human organs.

### **The Organ Utilization Act Criminalizes The Sale of Stem Cells Under Penalty of Perjury**

Since stem cells, especially adult stem cells, are considered part of the human body and its organs, the Jordanian Organ Utilization Law bans individuals from selling their stem cells, whether for fiscal repayment or profit, under the fine of criminalization. This is caused by violating Article 4 (j) of the mentioned law, which states that "donation of organs in exchange for fiscal repayment or for profit is not permitted." By reading the text of Article 4 (j) of the Jordanian Organ Utilization Law, the legislator visualized two scenarios of the criminal sale of body parts. The first one is when the sale is entirely for fiscal repayment, while the second one is when the sale is for financial gains.<sup>25</sup>

Even though the human body is priceless, a criminal transaction only qualifies if the financial compensation, whether paid in cash or kind in the form of real estate, vehicles, or other things, does not exceed the stem cells' actual value.<sup>26</sup> A gift agreement or a sales agreement may serve as the basis for the illegal selling of stem cells in exchange for money. The contract's procedures are not in question, and the presence of monetary remuneration is the only factor used to determine whether the disposal of stem cells was unlawful.<sup>27</sup> If the monetary sum or compensation for the stem cell outdoes its real value to make earnings, the transaction goes from a simple sale to a trade. The trade of stem cells does not have to include their buying and selling as a profession. Seeking profit from selling one's stem cells is enough to sort the action as a trade.

The researcher criticizes Jordanian legislator for using the word "donation" in the context of "monetary compensation or for earning" in Article 4 (j) of the Organ Utilization Law. Donation does not include any form of payment, illustrating the legislative ambiguity and textual instability of the phrases used in the text under discussion. The legislator ought to have said, "Selling is not legitimate," without making any allusion to the lack of money or other form of compensation, as it is assumed. The legislator may have stated, in one of two ways, "Giving up is not licensed" or "Controlling is not licensed," with a hint that there is no monetary or financial reward.

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<sup>25</sup> N. Iraine, The Criminal Responsibility of a Natural Person for Organ Trafficking According to Algerian Legislation, *Journal of Heritage, Ziane Achour University in Jelfa* 22, (2016), p. 25-39.

<sup>26</sup> Majed Al-Mashaqba, Comparative Study on the Management of Human Organs between Decriminalization and Criminalization, Master's Thesis, Al al-Bayt University, Jordan (2003).

<sup>27</sup> L. Birimberg-Schwartz, et.al., Validating Organoid-Derived Human Intestinal Monolayers for Personalized Therapy in Cystic Fibrosis, *Life Science Journal. Alliance* 6, (2023).

In accord with the Jordanian legislator, it is measured as a crime for a person to give up their stem cells when it is linked with material gain<sup>28</sup>, whether the compensation is capable to the value of the organ or greater (for profit). Article 10 of the same law punishes this attack with imprisonment for not less than one year or a fine of not less than ten thousand dinars, or both of these penalties, without transgressing any other punishment referred to any other legislation.<sup>29</sup> The referred punishment, whether taking away liberty or a financial fine, is relevant to the criminal severity that a person may impose on their own body. However, it is a combined punishment for two types of behavior. Ideally, the punishment for handling stem cells for profit should be higher than for dealing with stem cells in exchange for monetary compensation. This would be arranged with the principle of hierarchical gradation of punishment, as the higher the risk, the higher the punishment.

In this case, the principle of punishment proportionality justifies the Jordanian legislature's adoption of a combined punitive pattern. This is so because a minor offense has a minimum sentence of one year in jail and a maximum sentence of three years.<sup>30</sup> This gives the judge the freedom to impose a punishment, up to a point, based on the seriousness and gravity of the offense. This could allow the criminal judge to purposefully or accidentally misuse their authority.<sup>31</sup> It should be observed that considering stem cells as organs within the legal concept entails applying the Jordanian Organ Donation Law to stem cell control and the provisions of the Law on Combating Human Trafficking to actions involving the recruitment of individuals to use their bodies by extracting their stem cells.

The removal of stem cells from individuals after their recruitment, sale, purchase, or mediation is regarded as a crime of human trafficking<sup>32</sup>, punishable by a criminal penalty of temporary hard labor ranging from three to twenty years and a fine of not less than three thousand dinars and not passing ten thousand dinars.<sup>33</sup>

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<sup>28</sup> Al-Assari, Safian. "Conduct of human organs between the provisions of Islamic law and the rules of law El-Mussi", Faculty of Legal, Economic and Social Sciences, Marrakesh, (2009), p. 272-263.

<sup>29</sup> Organ Utilization Law: Article 4 (j).

<sup>30</sup> Jordanian Penal Code: Article 21

<sup>31</sup> Jordanian Penal Code,1960.)

<sup>32</sup> Osama Gharbi, "Trafficking in Human Organs, *Journal of Studies and Research*, 5, (2011), p. 180 - 190.

<sup>33</sup> Jordanian Law on Combating Human Trafficking: Article 8.

### **The Public Health Act Under the Stem Cell Regulation Criminalizes The Disposal of Human Stem Cells In Exchange For Payment**

The system ruling stem cells prohibit selling a person's stem cells, and the prohibition does not end there. It also bans any transaction involving a person's stem cells, whether selling or donating them for compensation. The system criminalizes such actions when they are connected with monetary gain. This is done to impede the exploitation of human stem cells and to secure them from the selfishness of individuals who might regard stem cells as a commodity for commercial goals.<sup>34</sup>

The legal framework established by the Jordanian legislature offers preventive criminal defense, establishing a preventive security mechanism to safeguard the integrity of stem cells. Individuals are prohibited from conducting any transaction involving their stem cells, whether adult or embryonic stem cells, in exchange for money, and selling one's stem cells is illegal. It is forbidden to get or dispose of stem cells in return for money, according to Article 6/A of the Stem Cell System. According to Articles 6 and 66 of the Public Health Law, the criminal liability for violating the provisions of Article 6/A of the Stem Cell System is organized. The penalties recommended in the Public Health Law are implemented for any violation of the provisions of the Stem Cell System and the regulations issued under it.

The legislator not only outlawed the trafficking of stem cells but also expected such criminal activities by struggling with the lack of sale of stem cells to avert the increase to the stage of human trafficking in their stem cells. Enabling individuals to control their stem cells, even if they are embryonic or renewable cells that they can do externally, would make them inspired by financial gain. They would start thinking about how to profit from selling their stem cells, shifting their concentration from mere compensation to financial gain and commerce, even at the cost of their health.

The legislator sees the payment of money in exchange for stem cells as criminalization. The phrase "material consideration" used in Article 6/A of the Stem Cell System refers to any action that receives monetary remuneration, whether in the form of money, goods, or another type of value. Suppose a person donates their stem cells without receiving payment, as long as all legal and medical standards are satisfied. In that case, their action does not fall under the purview of criminal prosecution.

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<sup>34</sup> M. Laalawi, "Criminalizing Human Organ Trafficking in Penal Legislation," *Journal of Jurisprudence and Law* 181, No. 192 (2014).

### **The Public Health Law under the Stem Cell Regulation Penalizes the Disposal of Stem Cells**

According to Article 66 of the Public Health Law, criminal liability does not increase for individuals selling their stem cells unless criminalized and accompanied by a penalty. Back to the provisions of Article 6 of the Stem Cell System, it does not mark a punishment or penalty. Its role is restricted to prohibition and prevention. This is because the principle of criminal legality stipulates that there is no crime or punishment except as given by law, and the "system" does not increase to the level of "law," which is considered the only origin of criminalization. According to Article 66 of the Public Health Law, violations of the Stem Cell System are punishable by imprisonment for two months to a year, a fine of at least 500 JD but not more than 1,000 JD, or by both of these punishments. Therefore, whoever sells, purchases, or handles their stem cells for financial gain is liable for these penalties.

We believe that the recommended punishment for the crime of selling stem cells comprises a double penalty made up of two aspects: the first one is a lack of liberty, as keeping in prison for a period of two months to one year is a misdemeanor penalty. The second one of the penalties is a financial punishment, described by a fine that the convicted person has to pay, not exceeding 10,000 JD. The Jordanian legislator has not marked the minimum sum for this fine, forcing the application of general rules that set the minimum at five dinars for misdemeanor penalties that do not indicate a minimum. The Jordanian legislator has cautioned the judiciary to decide the punishment for selling stem cells within the minimum and maximum limits of imprisonment and fine. The court can apply either of the punishments (imprisonment or a fine alone) or both together.

It should be observed that whether it is a lack of liberty or a financial fine, the punishment is not the planned goal. The goal is not to request revenge against individuals who handle their stem cells but instead to produce a criminal policy that directs to the misuse of stem cells to prevent anybody from being enticed to sell their stem cells and to save the following: the human body's health, organs, cells, and tissues.

The legislator has taken a sound penalizing approach by setting a financial ceiling for the fine that can reach 10,000 JD. These punishments reflect the current criminal policy of preventing offenders.<sup>35</sup> Simultaneously, the Jordanian legislator permits an essential difference between the minimum and maximum amounts of the financial fine, granting the criminal judge the control to decide it.

On the other hand, the researchers observed how the Public Health Law's mandatory imprisonment penalty (imprisonment for a period of two months to one year) contrasted with the Law on the Use of Human Body Organs' penalty

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<sup>35</sup> R. Al-Hani, "Criminal Policy to Combat Human Organ Trafficking," *Al-Fikr Al-Shurati* 27, 104 (2018), p. 45-87.

recommendation (imprisonment for a minimum of one year and a maximum of three years). Suppose a crime involves using a human bodily organ or stem cells from the victim's body. If these cells can be recovered and used again, or a portion can be used without risk or injury, this may be the root cause.

### **Donation and Limit of Stem Cells in Exchange for Compensation**

All acts are permissible unless a penal provision criminalizes them to safeguard an interest worthy of protection, and harming the human body by disposing of its stem cells is subject to criminalization.<sup>36</sup> However, the Stem Cell Regulation issued under the provisions of Article 6 of the Public Health Law permits the donation of stem cells for treatment and scientific research without material compensation or benefit or for profit, which necessitates drawing the boundaries of permissibility for the donation of human stem cells if it is in exchange for compensation.<sup>37</sup>

The precept of gratuitousness for the human donation of stem cells is incomplete, as some exceptions do not deny the essence of gratuitousness or change the act of donation into a monetary or commercial transaction. These exceptions function as compensation for the donor as a reward and support for their humanitarian performance. However, the compensation should not be essential or equivalent to the monetary value of the donated stem cells. These exceptional compensations include recognizing and appreciating the donor's humanitarian task.<sup>38</sup>

The gratuitousness principle, predicated on the absence of monetary compensation for donating human stem cells, does not prevent the donor from receiving all costs associated with the donation process in a hospital, treatment facility, or research institution. This includes charges like travel expenses, especially when going far away, as well as lodging, meals, hospital or center fees, and healthcare personnel's salaries. It is unjust to presume that the donor will pay for these costs.

### **A Person is Not Criminally Liable if He or She Receives Compensation For The Harm He Or She Has Suffered Due To Donating Stem Cells**

The donor of stem cells may have physical/material harm or both due to the stem cell donation process. Physical harm can happen if the donation process leads to accidental health effects. For instance, if a more significant amount of cells than permitted is removed from the spinal cord, it can bring about weakness

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<sup>36</sup> Abu Khattouah, *Criminal Law and Modern Medicine: Comparative Analytical Study on the Legitimacy of Organ Transplantation*. Cairo: Dar Al-Nahda Al-Arabiya, Cairo (1995).

<sup>37</sup>J. Al-Rawi, "The position of the Law on Eye Donation," *Cultural Journal*, 13, No. 12 (1987), p. 216-21

<sup>38</sup> M. Al-Mashaqbeh, *Dealing with Human Organs: Between Legalization and Criminalization*, Master's Thesis, Al al-Bayt University, Jordan, 2003.

or impairment of its duty. Moreover, surgical procedures involved in the donation process may be the reason for physical deformities in the body, such as the appearance of scars or wounds on the skin. The donor may also have short pain or discomfort after removing cells.

Some medical dangers of donating stem cells are as follows: When donating stem cells, particularly bone marrow, the protocol may involve a surgical intervention to extract the cells from the donor's bone marrow. As with any surgical protocol, possible dangers include infection, opposed reactions to anesthesia, and bleeding. In addition, Infection and bleeding are capable dangers connected with any surgical procedure. There is a feasibility of infection where the cells are removed when it comes to donating stem cells, and likewise, complications connected to bleeding, according to National Marrow Donor.

The harm caused by a person's donation of their stem cells can also be material. For example, remaining at a therapeutic or research center for some time without considering the aim of the donation may demand the donor to cancel work, resulting in the loss of salaries and financial stimulus. It may also include postponing or calling off some of their daily missions and obligations.

Giving the donor monetary or material compensation is never a problem as long as it stays within the parameters of correcting these harms and easing them for the donor, regardless of whether the harm brought on by the donor's stem cell donation is physical or material. However, compensation must not exceed these thresholds because doing so would convert the donation into a sale and subject the stem cell donor to accountability<sup>39</sup>.

Thirdly, allowing someone to give their stem cells can be justified if the risks are covered. Even if the duty is small, the donor may be responsible for risks associated with the medical procedure they undergo for donation. As a result, an insurance agreement could protect the donor from these risks. Suppose the donor of their stem cells has entered into a life or physical safety insurance agreement due to this donation. In that case, their legal liability is erased because such an agreement does not change the voluntary nature of this behavior.<sup>40</sup>

The stem cell therapy system permits the donation of stem cells as an inclusive principle for therapeutic goals and scientific research, in agreement with the provisions of Islamic law and established medical practices, provided that it falls within legal and health regulations. The permission to donate stem cells is not complete, as it is subject to limitations, the violation of which may go to criminalization of the donation. One of the most essential limitations is the demand for informed consent from the donor and guarantee that it does not damage public health.

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<sup>39</sup> M. Zahra, *Artificial Reproduction: Its Legal Provisions and Sharia Limits; Comparative Study*. Publications of Dhat Al-Salasil, Kuwait, 1993.

<sup>40</sup> A. Sharaf Al-Din, "Legal Regulations for the Legitimacy of Organ Transplantation," *National Criminal Journal* 21, No. 1 (1978). p. 115-136.

Acquiring informed consent is essential in granting permission for individuals to donate their stem cells. Informed consent backs to the written one of the donor, or one of their parents, protectors, or legal representatives, on the form issued by the Minister of Health dependent upon the recommendation of the National Committee for Stem Cells.<sup>41</sup>

### **The Legislature Has Placed Restrictions on Human Stem Cell Donation Under Penalty of Criminalization**

The function of stem cells in the Hashemite Kingdom of Jordan is measured as a therapeutic method that the average individual may be unfamiliar with, involving its nature and related dangers. An individual may reply to the call for volunteering to donate stem cells through the effect of promotional campaigns and speeches; the development of medical science creates a fertile environment for criminality in the biological world.<sup>42</sup>

Therefore, the Jordanian legislator supposed it necessary to acquire informed consent from individuals concerning their donation of stem cells. This is done by instructing the donor about the nature of the needed stem cells and supplying an extensive explanation of the whole process and possible complications<sup>43</sup> to ensure the donor's informed satisfaction.

On the other hand, and according to the related Indonesian laws, especially in the Act No. 36 of 2009 in which the utilization of stem cells is regulated in article 64 which reads: (1) Healing of diseases and health recovery can be carried out through organ and / or tissue transplantation, drug and/or medical devices implants, plastic surgery and reconstruction, and stem cell use, (2) Organ and/or tissue transplants as referred to in paragraph (1) are carried out only for humanitarian purposes and are prohibited from being commercialized, and (3) Organs and/or body tissues are prohibited from being traded under any pretext. Furthermore, in article 70, the Act states that: (1) Stem cells can only be used for the purpose of curing diseases and recovering one's health and are prohibited from being used for reproduction purposes, (2) Stem cells as referred to in paragraph (1) may not originate from embryonic stem cells, and (3) Further provisions regarding the use of stem cells as referred to in the paragraphs (1) and (2) are regulated by Ministerial Regulations<sup>44</sup>.

So, principally, stem cell therapy is permitted for healing diseases and humanitarian purposes but not for reproductive purposes. Besides, the tissues and cells used may not be commercialized and not originate from embryonic stem

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<sup>41</sup> Stem et al.: Article 8.

<sup>42</sup> F. Al-Shuaibi, "Legal Liability for Therapeutic Stem Cell Research: A Comparative Study," *Journal of Security and Law* 24, No. 1 (2016).

<sup>43</sup> Ch. Zakaria, "The Sale of Human Organs Between the Controls of Islamic Law and The Limits of The Law: A Comparative Study," *Journal of Law and Business*, (2022), p. 203-215.

<sup>44</sup> Indonesian Act No. 36 of 2009 on health.

cells. Lacking such informed consent, satisfaction would be unfinished.<sup>45</sup> If the donor's satisfaction is unfinished, if the consent for donating stem cells misses informed consent, or if the donor is not correctly informed about the information that compels revealing the nature of the medical procedure, then the act of donating stem cells falls within the region of criminalization. This is because any violation of the provisions of the Stem Cell System goes to the implementation of the rules of criminal liability as specified in the Public Health Law. However, this criminal liability does not extend to the individual donor but is limited to the medical being responsible for organizing the informed consent form for donation<sup>46</sup>.

### **Stem Cell Donation Must Not Harm Public Health Under Penalty of Criminalization**

The Minister of Health, on the foundation of the recommendation of the National Committee for Stem Cells, decides the cases in which the donation of stem cells is banned to save public health.<sup>47</sup> Violating these limits can lead to criminalization and criminal responsibility in agreement with the provisions of the Public Health Law.<sup>48</sup> Cases where the donation of stem cells is banned include a range of infectious or hereditary diseases. If any of these diseases are current in the donor's body, even in a soft part, they are banned from donating their stem cells. This is done to protect public health.<sup>49</sup>

The cases based on the recommendation of the National Committee for Stem Cells are A. Presence of an infectious or transmissible disease, or laboratory evidence of such a disease, in the donor or the donor's mother. Samples contain syphilis, hepatitis B and C, acute CMV, HTLV-I and II. B. Full-blown inherited disease conveyed through somatic chromosomes (autosomal dominant inheritance), or if the disease is transmitted through the X chromosome and leads to complete affliction in the recipient of the stem cells. Because of the information provided, when a person donates stem cells from their body, they need to undergo a medical laboratory examination by an expediter to identify their body's safety regarding the referred infectious or hereditary diseases. If stem cells are changed from a body that holds these diseases, it presents a danger to public health by possibly infecting the recipients with these diseases. Indeed, it may not prevent the danger of infecting the recipients of the donated stem cells. These hereditary or infectious diseases can be transformed into their kids and those who come in

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<sup>45</sup> M. Al-Taniji, *Crime of Trafficking in Human Organs, Tissues, and Cells in UAE Law: Translation* (2015).

<sup>46</sup> M. Al-Taniji, M. (2015). *Crime of Trafficking in Human Organs, Tissues, and Cells in UAE Law: Translation* (2015).

<sup>47</sup> Stem et al.: Article 6/b.

<sup>48</sup> Stem et al.: Article 18.

<sup>49</sup> Minister of Health, 2014.



touch with them. Therefore, it is banned for individuals to donate stem cells from their bodies without going through a medical laboratory test. According to Article 66 of the Public Health Law and Article 18 of the Stem Cell System, if a donor is found to be influenced with any of the marked diseases throughout the needed medical test, and despite that, they continue to donate their stem cells, they will be held criminally in charge of and penalized with imprisonment for a time ranging from two months to one year, or a fine of no less than 500 dinars and not exceeding 1,000 dinars, or both of these penalties may be done.

### **Criminal Responsibility for Human Acts Involving Stem Cells in Jordan**

The stem cell is considered a human organ like the rest of the organs of the human body. The stem cell is, of course, part of the human body. Therefore, the criminal liability provisions in the Law on the Use of Human Body Organs apply to the sale of stem cells. Through this law, the legislator imagined two forms of criminal sale of body organs; the first form is (abstract sale) if it is in exchange for an allowance, and the second form is (trading) if the sale is in exchange for a profit.

The Stem Cell Regulation issued under the Public Health Law enacted substantive legal rules that provided precautionary penal protection that created a preventive security that preserves stem cells from being tampered with by criminalizing the sale or disposal of human stem cells for a material consideration, whether the stem cells are embryonic or adult. However, the principle of free donation of human stem cells is not absolute. However, there are some exceptions to it that do not empty the principle of free donation of its content and do not turn the free donation behavior into a material or commercial behavior, so the exceptions come as compensation to the donor, provided that the amount of compensation is not large or equivalent to the amount of money that can be paid as the value of the stem cell that is the subject of the donation.

If the consent of the stem cell donor is incomplete, or if his consent is not informed, or if he is not informed of the information that the nature of the medical process requires disclosure, the act of donating stem cells is criminalized, as the violation of any of the provisions of the Stem Cell Regulation leads to the application of the rules of criminal liability. When a person donates stem cells from his body, he must undergo a laboratory medical examination from a specialized body that reveals the safety of his body from transmitted or inherited infectious diseases that the Minister of Health has indicated, based on the recommendation of the National Stem Cell Committee, under penalty of criminal liability.

Through the study of criminal liability for human disposal of stem cells, the researcher identified a set of observations on some of the provisions of the legislation regulating the disposal of stem cells and the utilization of human body organs. To this end, the researcher offers the legal legislator a set of

recommendations: The term "donation" is used by the Jordanian legislature in the context of exchange for money or for profit in Article (4/j)<sup>50</sup> of the Law on the Utilization of Human Body Organs. However, the donation does not imply any monetary compensation for the human body or its components, which exposes a weakness in the legislative phrasing of the paragraph above due to the discrepancy of its words. The legislator should ideally specify that "Sale is not permitted" without mentioning the lack of financial compensation or that "Transfer is not permitted" or "Disposition is not permitted." while mentioning the lack of financial compensation.

According to Public Health Law, the punishment for selling stem cells is commensurate to the degree of unlawful harm done to the human body. The severity of the penalty, however, is the same for both types of behavior: selling stem cells for a profit and selling stem cells in exchange for cash. According to the graded punishment theory, the penalty for selling stem cells to make a profit should be harsher than the penalty for selling stem cells for a fee. This requires the legislator to reevaluate and implement a graduated system of punishment, where the gravity of the offense determines the harshness of the punishment.

It is clear that the Public Health Law's penalty for breaking stem cell laws, which is an imprisonment term of between two months and a year, is less severe than the Law on the Utilization of Human Body Organs' penalty, which is an imprisonment term of between one year and three years. This calls for an increase in the recommended. Because stem cells are as important as the body and organs, no punishment should be under the Public Health Law. It is required for the Jordanian legislature to immediately include stem cells in the definition of the Law on the Utilization of Human Body Organs. By amending the statute above in addition to the one against human trafficking, which makes the recruiting of people for organ harvesting illegal, this modification seeks to improve the criminal prosecution of unlawful acts involving stem cells. As a result of their therapeutic potential in contemporary medicine, stem cells have attracted interest and attention.

## **Conclusion**

The objective of the research on the criminal liability of individuals for their behaviors, including stem cells, based on Jordanian legislation, is to create a sound legal system that provides a defensive limit to protect the exploitation of human stem cells. This is to make sure that they are not treated as one of the following: commodities, commercial goods, or a means for financial profit. The research tries to criminalize the sale of human stem cells or their disposal in barter for monetary compensation, safeguarding stem cells from improper use. It is significant to observe that the Jordanian Stem Cell System permits human stem

cell donation for therapeutic goals and scientific research as a general precept. This obligates the foundation of clear limits for allowed stem cell donation in exchange for compensation and the revelation of any boundaries on such donations under punishment of criminalization.

## References

### Journals and Books

- Abdelkader, Daoud, et.al., "Testing Organ-Specific Responses to Therapies in Tissues Differentiated from Cystic Fibrosis patient derived iPSCs, *Stem Cells Research*, (83). (2025).
- Abdullah, Yasser Mohammed, "Criminal protection of human organs: comparative study"; *Journal of the Faculty of Law* 5, No. 17 (2016).
- Abu-Khatwah, Ahmed. "*Criminal Code and Modern Medicine; Comparative Analysis of Transport Communism Human Organ Transplantation*", Arab Renaissance House, Cairo, (1995).
- Al-Mahaqbeh, Majid. "*Human Organ Conduct Between Pornography and Criminalization*": A Comparative Study, Master's Degree, Al-Bayt University, Jordan. (2003).
- Al-Assari, Safian. "*Conduct of Human Organs Between the Provisions of Islamic Law and The Rules of Law El-Mussi*", Faculty of Legal, Economic and Social Sciences, Marrakesh, (2009).
- Al-Awamleh, Atef. "*Legality of Research and Treatment with Anesthetic Cells*": Comparative Study Ph.D., Arab University of Oman, Amman-Jordan. (2013).
- Al-Mustafa, Iman Mukhtar, "*Stem Cells, and their effect on the medical and surgical work of Islamic Perspective*", Egypt: Al-Wafa Law Library. Penal Code No. 16 of 1960. (2012).
- Al-Rawi, Jaber. "Position of the Law on the Donation of Eyes", *Cultural Journal*, 12 (1987).
- Azhar, A., "Islamic Law Reform in Indonesia from the Perspective of Maqāsid Al-Sharī'ah: Kerinci's Intellectual Views, *Samarah: Jurnal Hukum Keluarga dan Hukum Islam* 8, No. 2 (2024).
- Bin Issa, Rashida. "Scientific Developments in the Cultivation of Human Organs in The Light of Sharia Law Islamic: Organic cloning and stem cells as a model" " *Journal of the University of Prince Abdulkader for Science Islamic* 351, (2021).
- Birimberg-Schwartz, L, et.al., "Validating Organoid-Derived Human Intestinal Monolayers for Personalized Therapy in Cystic Fibrosis, *Life Science Journal. Alliance* 6, (2023).

- Daoud, Abdelkader and Jorge O Múnera, “Insights Into Human Development and Disease From Human Pluripotent Stem Cell Derived Intestinal Organoids *Front. Medicine. (Lausanne)* 6, (2019).
- Dexheimer, Ryan. et.al., 2024. Generation of two iPSC Lines from Dilated Cardiomyopathy Patients with Pathogenic Variants in the SCN5A gene. *Stem Cell Res.* 80, (2024). <https://doi.org/10.1016/j.scr.2024.103498>.
- Farfaq, Muammar, “Crimes of Trafficking in Human Organs in the Algerian Penal Code”, *Journal Academy of Social and Human Studies*, A10, (2013).
- Gharbi, Osama. “Trafficking in Human Organs”, *Journal of Studies and Research*, (2011).
- Hui, Hongxiang, et.al., “Cells: General Features and Characteristics, (2011).
- Iffatin, Nur, “Stem Cell Therapy Its Legality in the perspectives of Indonesian Law and progressive Islamic Jurisprudence”, *International Journal of Advanced Research* 8, No. 2 (2020).
- Irraine, Nawal. “Criminal Liability of a Natural Person for The Crime of Organ Trafficking Algerian Legislation”, *Heritage Review*, A22, (2016).
- Laalawi, M. “Criminalizing Human Organ Trafficking in Penal Legislation,” *Journal of Jurisprudence and Law* 181, No. 192 (2014).
- Lelawi, Mohamed.” Criminalization of trafficking in human organs in Algerian legislation”, *Journal of Jurisprudence and the Law* 181, (192). (2014).
- Magdalene, Ahmed. “Transfer of Human Organs as A Trafficking Offense: Study Analysis in the Saudi System, *Institute of Public Administration*, 63 (4), (2023).
- Manhas, Amit. et.al., “Generation of two iPSC Lines from Vascular Ehlers-Danlos Syndrome (vEDS) Patients Carrying a Missense Mutation in COL3A1 gene. *Stem Cell Res.* 79. (2024). <https://doi.org/10.1016/j.scr.2024.103485>.
- Michele, Zahia, “Right to Dispose of Body Parts”, *Human Rights Journal Public Freedoms*, (2017).
- Nayak, Armiya, et.al., “Function of Stem Cells and Their Future Roles in Healthcare”, *International Journal of Pharma. Research and Review* 3, No. 5 (2014).
- Qtaishat, A., Interpretation of Micro-Organism under the TRIPS Agreement, *Business Law Review*, (4), (2014).
- Rahahleh, Rani.” Civil Liability for Stem Cell Banks in Jordanian Legislation, thesis Dukturah”, World Islamic University/Amman-Jordan. (2022).
- Ruslan, Al-Hani.”Criminal Policy to Counter Trafficking in Human Organs”, *Police Thought*, 27, (2018).
- Nazish Sayed, et.al., “Clinical Trial in a Dish Using iPSCs Shows Lovastatin Improves Endothelial Dysfunction and Cellular Cross-Talk in LMNA

- cardiomyopathy. *Sci Transl Med.* 12 (554). (2020).  
<https://doi.org/10.1126/scitranslmed.aax9276>.
- Nazish Sayed, et.al., “Translation of Human-Induced Pluripotent Stem Cells: From Clinical Trial in A Dish to Precision Medicine,” *J. Am. Coll Cardiol* 67, No. 18 (2016). <https://doi.org/10.1016/j.jacc.2016>.
- Sharafuddin, Ahmed.” Legal Controls of the Human Organ Transplantation and Transportation Project”, *Journal National Criminal Code*, 21 (1), attributes 115, 136. (1978).
- Shuaibi, Fouad. “Legal Liability for Stem Cell Therapeutic Experiments”: Comparative Study, *Journal of Security and Law* 24, No. 1 (2016).
- Tenigi, Mohammed. “*The Crime of Trafficking in Human Organs, Tissues and Cells in Law Emirates*”: Comparative Study, Ph.D. Thesis, University of Jordan. (2015).
- Thomas, D, et.al., 2024. CCL2-Mediated Endothelial Injury Drives Cardiac Dysfunction In Long COVID. *Nat. Cardiovasc. Res.* 3, No. 10 (2024). 1249–1265. <https://doi.org/10.1038/s44161-024-00543-8>.
- Wu, David, et.al., Generation of Induced Pluripotent Stem Cell Line from a Patient with Long COVID, *Stem Cells Research* 83, (2025).
- Zahra, Mohamed. “*Industrial Reproduction: Legal Provisions and Legal Limits*”; Comparative Study; Series Publications, Kuwait. (1993).
- Zakaria, Sheikh. “Sale of Human Organs Between Islamic Shariah Control and The Limits of The Law: Study Comparative”, *Journal of Law and Business*, (2022).

## **Law and Rules**

- Act No. 23 of 1977 on the utilization of organs of the human body, as amended.
- Decision of the Jordanian Fatwa Council No. (35) dated 12/23/1413 AH corresponding to 6/13/1993 AD.
- Decisions of the Islamic Fiqh Council affiliated with the Muslim World League in its twelfth session held in Makkah Al-Mukarramah during the period from Saturday 15 Rajab 1410 AH corresponding to February 10, 1220 AD to Saturday 22 Rajab 1410 AH corresponding to February 17, 1990 AD, Permanent Committee (21/452).
- Fatwas of the Fatwa Sector in Kuwait (2/188), Fatwa No. (651, 652).
- Fatwas of the Permanent Committee (21/443, 431, 438), Decisions of the Jordanian Fatwa Council No. (35) dated 12/23/1413 AH corresponding to 6/13/1993 AD,
- Indonesian Act No. 36 of 2009 on health.
- Public Health Act No. 47 of 2008, as amended.
- Regulation No. 32 of 2018 concerning the management of Stem Cells and/or Cells Services.

Regulation No. 62 of 2013 concerning the Management of Bank of Tissues  
and/or Cells.

The Prevention of Trafficking in Human Beings Act No. 9 of 2009.

The stem cell system No. 10 of 2014.