Exploration and Practice of Implementing Curriculum Ideology and Politics in Stem Cell Biology Teaching

Authors: Li Lisha, Hou Xiangyi, Li Yanru, Wang Yishu, Wang Yishu

Date: 2025-08-23T00:00:00+00:00

Abstract

[Objective] To provide ideas for the ideological and political education reform in stem cell biology courses, align with the "foster virtue and cultivate talent" goal of universities, and cultivate well-rounded high-quality talents. [Methods] Analyze practical problems in ideological and political education in stem cell biology courses, and excavate ideological and political elements and moral education resources from four aspects: analysis of course characteristics, summary of course ideological and political elements, design of ideological and political integration into teaching, and teaching effectiveness evaluation and reflection. [Results] Completed preliminary thinking and exploratory practice of ideological and political education in stem cell biology courses, achieving in-depth excavation of ideological and political elements and moral education resources. [Limitations] It is only preliminary thinking and exploratory practice, with no mention of large-scale teaching practice verification or long-term effect tracking data. [Conclusion] Integrating ideological and political education into stem cell biology teaching aligns with the development of the times and lays a solid foundation for cultivating high-quality talents.

Full Text

Exploration and Practice of Implementing Ideological and Political Education in Stem Cell Biology Teaching

Li Lisha[1], Hou Xiangyi[1], Li Yanru[1], Wang Yishu[1]*
[1]Department of Pathology, College of Basic Medical Sciences, Jilin University, Changchun 130000, China
*Corresponding author: Wang Yishu, email: wangys@jlu.edu.cn

Abstract:
[Objective] To provide ideas and references for the ideological and political

teaching reform of the Stem Cell Biology course, align with the university goal of "fostering virtue through education," and cultivate high-quality talents with all-round development.
[**Methods**] We analyzed practical problems in the ideological and political teaching of the Stem Cell Biology course and explored ideological and political elements as well as moral education resources from four aspects: course characteristic analysis, summary of ideological and political elements, integration of ideological and political concepts into teaching design, and evaluation and reflection on teaching effects.
[**Results**] We completed preliminary thinking and exploratory practice on the ideological and political teaching of the Stem Cell Biology course and realized in-depth exploration of ideological and political elements and moral education resources in the course.
[**Limitations**] This work only involves preliminary thinking and exploratory practice, without mentioning large-scale teaching practice verification and long-term effect tracking data.
[**Conclusions**] Integrating ideological and political education into Stem Cell Biology teaching conforms to the development of the times and lays a solid foundation for the cultivation of high-quality talents.

Keywords: Stem Cell Biology; Courses Integrating Ideological and Political Education; Graduate Student Teaching; Teaching Reform

This work was supported by the Graduate Course Ideological and Political Education Demonstration Course Construction Project of Jilin University (Project No. 2023KCSZ27).

Stem cells possess the capacity for self-renewal and differentiation into various cell lineages, playing crucial roles in the development and maintenance of multiple tissues and organs [1]. As a highly frontier discipline, stem cell biology is dedicated to studying the properties and functions of stem cells and their applications in life development and regenerative medicine. It has gradually encompassed and integrated multiple disciplines including cell biology, molecular biology, and genetics, becoming an important component of current biomedical research [2]. In recent years, to meet the demands of disciplinary development, major universities have introduced relevant content of stem cell biology into their teaching systems [3]. After decades of development, the Department of Pathology at Jilin University has assembled a group of high-level faculty members deeply engaged in stem cell biology, providing advantageous conditions for offering a graduate-level "Stem Cell Biology" course. Furthermore, in the field of higher education, curriculum-based ideological and political education has gradually become an important educational reform content, especially under the guidance of current national policies, which has led to the deepening of ideological and political education in university teaching systems.

In recent years, the state has continuously strengthened the concept of "curriculum ideological and political education," explicitly requiring that all professional courses should not only focus on the transmission of professional knowledge but

also guide and shape graduate students' values, worldview, and outlook on life [4]. The Ministry of Education' s recently released "Overall Plan for Deepening Education Evaluation Reform in the New Era" mentions the need to strengthen curriculum ideological and political construction, integrate ideological and political work into the teaching of various professional courses, and give full play to the core role of classroom teaching in moral education [5]. Against this background, university stem cell biology courses must not only shoulder the responsibility of knowledge transmission but also undertake the mission of guiding graduate students to form correct values and social responsibility [6]. The teaching content of stem cell biology courses highly aligns with the goals of ideological and political education, involving life ethics, scientific morality, and the social responsibility of technology application—topics that are currently hot issues of social concern and provide rich educational resources for implementing curriculum ideological and political education.

However, despite the growing importance of ideological and political education in stem cell biology teaching, traditional teaching processes still struggle to reveal the ideological elements embedded within professional knowledge. Classroom teaching generally features didactic instruction that neglects the cultivation of graduate students' values, scientific literacy, and professional ethics [7]. On the one hand, teaching often overemphasizes technical content while seriously underemphasizing life ethics and ideological and political education. Although graduate students master stem cell-related technologies, they lack profound understanding of research ethics and social responsibility. On the other hand, current ideological and political education in biology courses mostly focuses on traditional disciplines such as cell biology, while practical research on ideological and political education in stem cell biology remains scarce [8]. Moreover, in limited attempts at integration, there exist drawbacks such as superficial excavation of ideological elements and lack of systematic case teaching, making it difficult to truly leverage the role of ideological and political education in shaping graduate students' values.

Therefore, it is necessary to deeply integrate the concept of curriculum ideological and political education into the professional teaching of stem cell biology to fill the gap in ideological and political education in this field, change the imbalanced state of traditional teaching, systematically excavate ideological elements, carefully design case teaching, guide graduate students to establish correct research values, and contribute to the healthy development of the stem cell field. This paper explores reform strategies for deeply integrating ideological and political education into stem cell biology teaching and proposes a series of feasible teaching reform measures. Furthermore, the successful implementation of these teaching reforms will provide reference and guidance for teaching reforms in other biomedical-related courses, holding important theoretical and practical significance.

2. Analysis of Stem Cell Biology Course Characteristics

The stem cell biology course possesses remarkable cutting-edge characteristics and practicality. In terms of cutting-edge nature, the course content covers multiple key sections of the stem cell field, from basic concepts such as introductions and overviews of stem cells, to in-depth discussions of their proliferation cycles, differentiation, and regulatory mechanisms, and further to the relationship between cytokines, signal transduction, and the regulation of stem cell proliferation and differentiation. It also includes characteristics of embryonic stem cells and adult stem cells, applications of stem cells in wound repair and tissue regeneration, and even content related to stem cell aging. This knowledge system builds graduate students' comprehensive understanding of stem cell biology and lays a foundation for subsequent in-depth research and practice. However, with the rapid development of stem cell research, there exists a lag in course content updates, with insufficient and untimely integration of emerging research results such as induced pluripotent stem cells (iPSCs), regenerative medicine, and gene editing. These frontier technologies often involve complex ethical controversies and significant social responsibilities that require further in-depth discussion in the course. Regarding practicality, although the course is primarily theory-based, the experimental techniques involved are closely integrated with clinical applications. For example, in research on stem cell therapy for diseases, graduate students need to master experimental techniques such as cell culture and identification to better understand their clinical application value. Nevertheless, the current practical teaching component is relatively weak, and the integration between theory and practical application is insufficient, limiting graduate students' ability to apply knowledge in practice. Therefore, teaching should strengthen the cultivation of scientific rigor among graduate students.

3. Ideological and Political Education Elements in Stem Cell Biology Courses

During the teaching process of stem cell biology courses, the history of disciplinary development, major scientific research achievements, and outstanding deeds of scientists in this field can be transformed into effective carriers for stimulating graduate students' patriotic sentiment, providing abundant space and close integration points for ideological and political education.

3.1 Research Spirit in Stem Cell Biology

Research spirit constitutes a combination of rational belief, empirical methods, critical attitude, and trial-and-error patterns. In cultivating research spirit, the history of stem cell biology and its major research achievements provide ample materials for ideological and political education. In recent years, the stem cell field has witnessed numerous breakthroughs, with many research teams demonstrating excellent research spirit. For example, facing the challenges of donor shortage and immune rejection in traditional islet transplantation, Professor

Deng Hongkai' s team at Peking University and collaborators first cultivated functional islet cells from embryonic stem cells in 2014, and in 2024, employed chemical reprogramming technology to bypass gene editing risks and efficiently differentiate iPSCs into islet β cells [9]. The research team used empirical methods as their weapon, carefully designing experiments, rigorously analyzing data, continuously verifying theoretical hypotheses, and improving research approaches. Over the past decade, they have been committed to optimizing the chemical induction system. Facing uncertainty, the team maintained a critical attitude, questioning traditional technologies. After recognizing the risks of gene editing, they boldly adopted chemical reprogramming technology to open new paths. In pursuing efficient differentiation of islet β cells, they implemented trial-and-error patterns throughout the process, screening over 300 small molecule combinations. From an initial differentiation efficiency of less than 5%, through countless failures and adjustments, they ultimately increased the differentiation efficiency to over 80% [10]. In 2024, the research team evaluated the feasibility of autologous transplantation of chemically induced pluripotent stem cell-derived islets (CiPSC-islets) under the abdominal anterior rectus sheath for treating Type 1 diabetes [11], reporting positive clinical data from subjects after CiPSC-islet transplantation and the achievement of routine, non-invasive graft monitoring under the abdominal anterior rectus sheath. This marks a step forward in realizing the potential of personalized cell therapy using CiPSCs for disease treatment [9]. Professor Deng Hongkai' s research not only achieved major academic breakthroughs but also demonstrated scientists' perseverance and innovative spirit—qualities that can inspire graduate students to continuously explore and pursue excellence on their academic paths.

3.2 Patriotic Sentiment in Stem Cell Biology

Patriotic sentiment is the long-standing spiritual core of the Chinese nation. In the field of stem cell biology, countless researchers have devoted themselves to research with deep patriotic sentiment. From the early difficult exploration of stem cell technology to now gaining prominence on the international stage, their efforts have not only promoted the vigorous development of stem cell biology domestically but also contributed to the advancement of the nation' s medical and health undertakings. For example, after completing his undergraduate studies at the School of Life Sciences at Peking University, Dr. Shao Sida pursued his doctoral degree at the Scripps Research Institute in the United States, focusing on stem cells and regenerative medicine research. Despite making important breakthroughs abroad and establishing a family, he resolutely returned to China to join Westlake University, leading a team to study stem cell biology using chemical biology approaches, searching for tool molecules that can specifically regulate stem cell fate and function, and developing novel regenerative medicine drugs [12]. Through chemical genomics methods, Dr. Shao Sida discovered that dipeptidyl peptidase-4 (DPP4) plays a key role in regulating alveolar stem cell proliferation. His research showed that continuous inhibition of DPP4 in the alveolar lumen can effectively promote damaged alveolar repair

[13]. Based on this discovery, Dr. Shao and his team launched translational medical research, successfully developing the world' s first candidate drug that can promote alveolar regeneration, which entered Phase I clinical trials in 2024 and is expected to provide new treatment options for various lung diseases, bringing hope to hundreds of millions of lung disease patients worldwide. He emphasizes that research requires "coming early and leaving early" to maintain a healthy rhythm, and he devotes himself to cultivating the team' s scientific holistic view, encouraging students to integrate personal ideals into the strategic needs of national biomedicine development. His choice demonstrates the original aspiration of "serving the country through science," which has not only won international discourse power for China' s stem cell research but also provided Chinese solutions for conquering major diseases, becoming a benchmark for young scholars to inherit the national mission and worthy of learning and inheritance by every graduate student.

Meanwhile, teachers can also use case comparisons to explore, for example, the technological gap between domestic and international stem cell therapy for systemic lupus erythematosus (SLE). This not only enables graduate students to understand cutting-edge technological applications but also stimulates their sense of responsibility for achieving technological self-reliance. In international stem cell therapy research for SLE, there is already substantial clinical trial data supporting its efficacy and safety, with some studies entering Phase I-II clinical trials [14]. In contrast, although China has made progress in patents and clinical trial approvals, the overall maturity of clinical applications remains relatively lagging. Through actual domestic and international case comparisons, graduate students can understand that China still needs to work harder in stem cell technology application, stimulating their sense of responsibility for technological self-reliance and encouraging them to commit to narrowing the gap with international advanced levels and contributing to the development of China' s stem cell technology in their future studies and research.

3.3 Bioethics and Social Responsibility in Stem Cell Biology

Finally, in the vigorous development of stem cell biology, bioethics and social responsibility are always important issues that cannot be ignored [15]. During the teaching process, teachers can guide graduate students to focus on discussing ethical and social responsibility issues in stem cell research. For example, embryonic stem cell sources involve manipulation of human embryos, and researchers must find a delicate balance between pursuing scientific breakthroughs and maintaining life ethics. In the development of iPSC technology, researchers should be committed to developing safer and more ethically compliant methods. Social responsibility is also a key consideration in stem cell biology development. On the one hand, ensuring the safety and efficacy of stem cell therapy and preventing technology abuse is the shared responsibility of researchers and regulatory authorities. On the other hand, enabling stem cell therapy technology to benefit a wider population and breaking geographical and economic limitations is the

expectation of the entire society. Only by adhering to high moral consciousness and social responsibility can stem cell technology continue to advance on the right track and become a powerful force for enhancing human well-being.

Furthermore, in the dimension of bioethics and social responsibility, case teaching should be combined with norms such as the Declaration of Helsinki and the Ethical Guidelines for Human Embryonic Stem Cell Research. Taking iPSC clinical application as an example, researchers must follow the three-level review system of the ISSCR Guidelines for Stem Cell Research and Clinical Translation: avoid embryo use controversies in the experimental design phase, establish a traceable quality control system in the cell preparation stage, and implement strict tumorigenicity assessments in preclinical research. Demonstrating this process of transforming policies and regulations into specific research codes can help graduate students deeply understand the social responsibility boundaries of researchers. In summary, closely integrating ideological and political education with the knowledge system of stem cell biology courses can not only enhance graduate students' academic literacy but also strengthen their sense of social responsibility, laying a solid foundation for cultivating high-quality talents.

4. Teaching Design for Integrating Ideological and Political Education into Stem Cell Biology

Constructing a content system that integrates ideological and political education into stem cell biology classroom teaching requires systematically organizing teaching content based on the concept of curriculum ideological and political education, excavating ideological elements, combining them with professional knowledge points, and improving teaching methods.

4.1 Advancing Curriculum Ideological and Political Education Through "Online + Offline" Blended Teaching Mode

In advancing curriculum ideological and political education in stem cell biology, the "online + offline" blended teaching mode can effectively enhance graduate students' understanding of life ethics and social responsibility [16]. With the development of information technology, teachers can utilize online educational resources such as Massive Open Online Course (MOOC) platforms to introduce discussions on international academic ethics controversies. For example, showing real cases where subjects' rights were harmed due to ethical review loopholes in foreign stem cell clinical trials allows graduate students to watch independently after class and express their opinions. Graduate students can exchange views on ethical issues in these events in discussion forums, analyzing the responsibilities that researchers, regulatory agencies, and other parties should bear, while teachers guide the direction to help graduate students deeply understand the ethical bottom line of stem cell research. On the other hand, offline group debates can be organized on the theme "Ethical Reflections on Gene-Edited Babies." Graduate students can be divided into pro and con sides,

with the pro side elaborating on potential advantages of gene editing technology in disease prevention (while reasonably controlling boundaries) and the con side focusing on rebuttals from perspectives such as violating natural genetic laws, destroying human gene pool diversity, and potential social ethical chaos. The debate process not only enables students to deeply analyze the ethical issues of the event but also exercises critical thinking and teamwork skills. After the debate, teachers summarize, emphasizing that stem cell biology and related frontier technology development must adhere to ethical morality and social responsibility, guiding graduate students to establish correct research values.

4.2 Expanding Curriculum Ideological and Political Education Through the "Second Classroom"

Meanwhile, in the practice of curriculum ideological and political education in stem cell biology, the "second classroom" can be utilized to actively expand diverse teaching methods [17]. On the one hand, organizing graduate students to visit local biomedical enterprises, such as stem cell clinical research bases, allows them to personally experience the process of stem cell technology moving from the laboratory to clinical application. Before the visit, teachers can communicate with relevant enterprises to design detailed visit procedures including research and development history, clinical application case explanations, and corporate social responsibility introductions. Inviting enterprise R&D personnel to share the arduous process from basic research to technological breakthroughs helps graduate students understand that research is not only about knowledge exploration but also about solving practical social problems, and how scientific research achievements are transformed into actual medical means to bring benefits to patients, thereby inspiring their enthusiasm for engaging in research and serving society. On the other hand, teachers can guide graduate students to design open-ended topics, such as "Application Prospects of Stem Cell Technology in an Aging Society." During the exploration process, graduate students can not only deeply master stem cell biology theories and techniques but also cultivate research thinking and experience the research spirit of innovation and fearlessness of failure. In addition to participating in on-campus research projects, graduate students are also encouraged to apply for various graduate innovation and entrepreneurship projects at the Jilin Province and national levels, receiving comprehensive training in all aspects from project proposal writing, project implementation, data analysis, to final report presentation, thereby enhancing professional confidence.

4.3 Optimizing the Assessment and Evaluation System to Consolidate Curriculum Ideological and Political Education

The teaching assessment and evaluation system serves as a critical hub for teaching quality control, possessing the dual functions of diagnosing student learning conditions and guiding teaching direction. It is the cornerstone for achieving steady improvement in teaching quality and the core indicator for measuring

teaching effectiveness and determining the degree of teaching goal achievement. In the stem cell biology course, to comprehensively and accurately assess graduate students' learning process and deeply examine their practical operation abilities, the course assessment should abandon the traditional single final examination model and innovatively adopt a combination of process evaluation and summative evaluation, emphasizing the key position of process evaluation in the entire assessment system and comprehensively considering graduate students'performance at all learning stages to ensure more scientific and comprehensive teaching assessment [18]. To enable graduate students to master the basic theories of stem cell biology while subtly embedding and infiltrating ideological elements into knowledge points, the previous assessment ratio can be changed to construct a new evaluation system including group discussions and debate competitions (15%), open-ended topic design (15%), in-class quizzes (10%), online learning (10%), and final examinations (50%), comprehensively examining graduate students' mastery of the stem cell biology knowledge system.

5. Teaching Effectiveness Evaluation and Reflection

Based on the completed teaching design integrating curriculum ideological and political education into stem cell biology and the constructed content system, we conducted multi-dimensional teaching effectiveness evaluation to deeply analyze problems in the teaching process, aiming to continuously optimize the integration of curriculum ideological and political education with stem cell biology teaching and improve teaching quality.

5.1 Teaching Effectiveness Analysis

Curriculum ideological and political education, as an innovative path for university ideological and political education, aims to cultivate new era youth with ideals and aspirations during the process of professional knowledge transmission. In the field of stem cell biology, our department has implemented curriculum ideological and political education for over three years, with numerous graduate students participating. To evaluate the reform effectiveness, we conducted a questionnaire survey among the 2024 cohort of graduate students. The results showed that integrating curriculum ideological and political education into the stem cell biology course significantly enhanced graduate students' professional ideological stability and corrected their learning attitudes. Up to 97% of graduate students were highly interested in the stories told in class about scientists devoting themselves to stem cell research and serving their country; approximately 93% reported that curriculum ideological and political education enhanced their identification with the stem cell profession and stimulated their interest in exploring stem cell knowledge; over 90% believed that curriculum ideological and political education improved their political and ideological levels and shaped correct worldviews.

In addition to focusing on graduate students' learning attitudes and professional identification, we specifically added evaluation indicators reflecting graduate

students' ideological and political literacy in actual research or practice. For example, whether they strictly adhere to ethical norms in research projects, whether they can prudently consider research directions from national needs, and whether they demonstrate perseverance and determination to contribute to the national scientific research cause when facing research difficulties. At the learning performance level, the implementation of curriculum ideological and political education has greatly increased graduate students' research participation. Students more actively participate in stem cell-related research projects, demonstrating high enthusiasm in both classroom discussions and after-class inquiries. From course feedback, the frequency of keywords such as "patriotic sentiment" and "ethics" has significantly increased. When discussing stem cell research directions, students begin to think from the perspectives of national needs and human welfare, and when discussing stem cell technology applications, they also deeply consider scientific ethical boundaries.

5.2 Reflection and Future Improvement Directions

Although certain achievements have been made in the teaching practice of curriculum ideological and political education in stem cell biology, some problems remain that require reflection and improvement strategies. First, some teachers fail to fully comprehend the deep connotation of curriculum ideological and political education, only rigidly embedding ideological elements into teaching content, resulting in unnatural and unsmooth connection between ideological and political education and professional knowledge. To solve this problem, subsequent efforts should focus on strengthening the construction of the curriculum ideological and political education teaching team, organizing teachers to deeply study the concept of curriculum ideological and political education, and enhancing teachers' ability to organically integrate ideological and political education with professional teaching, truly achieving the coordinated advancement of knowledge transmission and value guidance. Second, the quality evaluation system for curriculum ideological and political education remains imperfect. Currently, there is no unified and comprehensive evaluation standard for teachers' implementation of curriculum ideological and political education in stem cell biology teaching, including whether it is implemented, whether the implementation methods are appropriate, and what the implementation effects are, making it difficult to accurately assess the implementation effects of curriculum ideological and political education. To improve this situation, a scientific and complete curriculum ideological and political education assessment index system should be constructed as soon as possible to comprehensively evaluate the implementation from multiple dimensions. Additionally, given the increasingly deep cross-disciplinary integration of stem cell technology with other fields, such as the continuous emergence of new ethical issues in the intersection of artificial intelligence and stem cell research, we must dynamically update the case library and timely introduce these frontier issues into teaching to guide graduate students to think and discuss, cultivating their critical thinking and sense of social responsibility.

This paper has detailed the implementation path of curriculum ideological and political education in stem cell biology courses, enhancing graduate students' cognition of life ethics and social responsibility through methods such as the "online + offline" blended teaching model and utilizing the "second classroom" to expand curriculum ideological and political education. Curriculum ideological and political education forms a "trinity" education model with "scientific spirit as the core, patriotic sentiment as the driving force, and ethical responsibility as the boundary," aiming to shape correct research values among graduate students and cultivate their sense of mission and responsibility. Looking ahead, curriculum ideological and political education in stem cell biology needs to explore interdisciplinary linkage, combining with courses such as medical ethics and philosophy of science and technology to broaden graduate students' thinking horizons. Simultaneously, constructing a curriculum ideological and political education case library from an international comparative perspective will enhance graduate students' global competence, enabling them to better cope with international scientific research cooperation and challenges. Strengthening curriculum ideological and political education and perfecting the education system are key to cultivating high-quality research talents and important guarantees for promoting the sustainable development of China' s stem cell research field and occupying an advantageous position on the international stage.

References:

LIU S, REN J, HU Y, et al. TGFβ family signaling in human stem cell self-renewal and differentiation [J]. Cell Regen, 2024, 13(1): 26.

WANG L Y, KANG L. Exploration of lecture-based teaching methods by faculty teams in the "Stem Cell Biology"course [J]. Education Teaching Forum, 2024(33): 14-17.

LEI W. Thoughts on promoting "Stem Cell Biology" teaching reform through "Internet Plus" [J]. Industry and Technology Forum, 2022, 21(09):

YANG C, CHEN H. Reflection and exploration on ideological and political teaching in cell biology courses [J]. Journal of Higher Education, 2024, 10(25): 185-188.

YANG J P. Research on practical dilemmas and promotion strategies of education evaluation reform policy in the new era [J]. Wuhan University Journal (Philosophy and Social Sciences Edition), 2022, 75(06): 181-190.

NIU Y Y, HE Y H, JIAO Y M, et al. Discussion on teaching reform of medical cell biology for improving medical students' scientific research literacy under the background of "New Medical Science" [J]. China Journal of Multimedia & Network Teaching (Early Issue), 2024(09): 189-192.

LIU H Q, YANG J X, BU T, et al. Exploration and practice of cell biology teaching with output orientation and deep integration of curriculum ideological

and political education [J]. Chinese Journal of Cell Biology, 2025, 47(01): 101-110.

WANG X M, YANG Z H, WANG R J, et al. Research on ideological and political teaching practice of cell biology courses in the new era [J]. Gansu Education Research, 2024(16): 121-123.

CHEN T, ZHAO X. Reflections on body ethics in contemporary life science and technology: Taking stem cells, brain science, and synthetic biology as examples [J]. Medicine and Philosophy, 2024, 45(12): 11-15+33.

CHEN X F, SUN W W, ZHANG W, et al. Construction and practice of an integrated experimental course in molecular medicine under the background of new medical science [J]. Basic Medical Education, 2025(02): 159-163.

YANG J W, TANG X, JIN X, et al. Research and practice on integrating ideological and political education into "Cell Biology" course teaching [J]. Journal of Chifeng University (Natural Science Edition), 2024, 40(02): 86-90.

WU L M, YU Y C, CHEN F, et al. Exploration of integrated teaching model based on curriculum ideological and political education: Taking cell biology course as an example [J]. Journal of Higher Education, 2024, 10(S2): 57-60.

WANG S, DU Y, ZHANG B, et al. Transplantation of chemically induced pluripotent stem-cell-derived islets under abdominal anterior rectus sheath in a type 1 diabetes patient [J]. Cell, 2024, 187(22): 6152-64.e18.

LIUYANG S, WANG G, WANG Y, et al. Highly efficient and rapid generation of human pluripotent stem cells by chemical reprogramming [J]. Cell Stem Cell, 2023, 30(4): 450-9.e9.

LIANG Z, SUN D, LU S, et al. Implantation underneath the abdominal anterior rectus sheath enables effective and functional engraftment of stem-cell-derived islets [J]. Nat Metab, 2023, 5(1): 29-40.

SHALHOUT S Z, YANG P Y, GRZELAK E M, et al. YAP-dependent proliferation by a small molecule targeting annexin A2 [J]. Nat Chem Biol, 2021, 17(7): 767-75.

SHAO S, ZHANG N, SPECHT G P, et al. Pharmacological expansion of type 2 alveolar epithelial cells promotes regenerative lower airway repair [J]. Proc Natl Acad Sci U S A, 2024, 121(16): e2400077121.

ZARE MOGHADDAM M, MOUSAVI M J, GHOTLOO S. Stem cell-based therapy for systemic lupus erythematous [J]. J Transl Autoimmun, 2024, 8: 100241.

(Corresponding author: Wang Yishu, E-mail: wangys@jlu.edu.cn)

Author Contributions:
Li Lisha: Conceived the research idea and designed the research plan;
Hou Xiangyi: Drafted the manuscript;

Li Yanru: Acquired, provided, and analyzed data;
Wang Yishu: Revised the final version of the manuscript.

Note: Figure translations are in progress. See original paper for figures.