

昆明医科大学动物实验伦理审查申请表

编 号

The Applocation For Animal Exprimental Ethical Inspection

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课题名称及编号 Program and No.	2 型糖尿病大鼠模型糖尿病相关认知异常与基于磁共振 3D-ASL 的 CBF 及 VEGF 相关性研究 Diabetes-Associated Cognitive Dysfunction and Its Correlation with Cerebral Blood Flow Alterations as Measured by 3D-ASL and the VEGF Expression in the Hippocampus in a Rat Model of Type 2 Diabetes	课题来源 sponsor	云南省内分泌临床中心, 创新团队。 The fund of the Diabetic Innovation Team in Yunnan Province, Endocrine Clinical Medical Center of Yunnan Province.
课题负责人 Name of Principal Investigator	邵举薇 Juwei Shao	科室 Department	放射科 Department of Radiology
动物实验负责人 Contact Person	邹英鹰 Yingying Zou	电话和信箱 Contact Tel. No. and Email	13099992349 wave.forever@yeah.net
课题实施动物实验人数 Number of Implement	9	经专业培训的人数 Number of certificate	1
参与动物实验操作人员姓名、相关专业证书编号, 经验、培训、资质和能力的描述 Name and certificate number, Description of experience/training/competency of the individuals carrying out the research 邹英鹰, 证书编号: S032/08 (M, R &AS), 熟练掌握糖尿病大鼠造模、取材相关实验操作, 熟悉动物麻醉、手术及安乐死操作。 Name: Yingying Zou, certificate number: S032/08 (M, R &AS) , master the related experimental operation of diabetic rat modeling and sampling, familiar with animal anesthesia, operation and euthanasia.			
动物实验设施许可证编号 Name and certificate number of the facility SYXK (滇) K2020-0006 SYXK (Yunnan Province) K2020-0006		特殊实验设施许可证编号 Name and certificate number of the facility	

现有动物实验设施条件是否与拟开展动物实验的规范性要求相匹配的描述 Conformity of facility condition and proposed to carry out experiment requirement 昆明医科大学实验动物学部局部拟开展动物实验的规范及要求。 Specifications and requirements of animal experiments to be carried out in the experimental animal Centre of Kunming Medical University			
拟实验时间: 2019 年 9 月 30 日 至 2020 年 4 月 30 日 Experimental period: Y M D to Y M D 2019-9-30 to 2020-4-30			
动物实验项目的目的、必要性、意义和如何设计以达成研究目标的 Experimental objective, necessity and significance and how the program has been designed to achieve the objectives of the research. 本研究旨在研究 2 型糖尿病大鼠海马脑灌注参数、VEGF 表达与认知功能异常的相关性, 明确糖尿病致认知功能异常的原因以及寻找无创发现认知功能改变的影像学方法。采用 2 性糖尿病大鼠模型, 进行水迷宫实验评价认知功能改变, 用 3.0T 磁共振扫描大鼠脑部得到海马灌注参数, 取材海马组织免疫荧光分析海马 VEGF 表达水平, 统计学分析海马灌注参数、VEGF 表达水平及认知功能改变的相关性。 The purpose of this study was to investigate the correlation between cerebral perfusion parameters, VEGF expression and cognitive dysfunction in type 2 diabetic rats, to clarify the causes of diabetic cognitive dysfunction and to find a noninvasive imaging method to detect the changes of cognitive function. The water maze test was used to evaluate the cognitive function of rats with type 2 diabetes mellitus. The perfusion parameters of hippocampus were obtained by 3.0T MRI. The expression of VEGF in hippocampus was analyzed by immunofluorescence. The correlation of hippocampal perfusion parameters, VEGF expression and cognitive function was analyzed statistically.			
拟使用动物信息 Animal to be used	动物来源 Animal origin 昆明医科大学动物部 From the experimental animal Centre of Kunming Medical University 许可证编号 Certificate number SCXK (滇) 2020-0004 (SCXK 2020-0004; Kunming, China)		质量合格证 Certification of fitness <input checked="" type="checkbox"/> 有 <input type="checkbox"/> 无
	品种/品系(breed/strain): <input checked="" type="checkbox"/> 大鼠 rat <input type="checkbox"/> 小鼠 mice <input type="checkbox"/> 裸鼠 nude mice <input type="checkbox"/> 兔 rabbit <input type="checkbox"/> 犬 dog <input type="checkbox"/> 灵长类 primary animal <input type="checkbox"/> 转基因动物 genetically modified animal <input type="checkbox"/> 其他 (具体说明) others		等级 Grade <input type="checkbox"/> 普通 <input type="checkbox"/> CV <input type="checkbox"/> 清洁 <input type="checkbox"/> CL <input checked="" type="checkbox"/> SPF <input type="checkbox"/> GF <input type="checkbox"/> 其他
	数量只 (♀: ♂ 40 ♂) Number(♀: ♂ 40 ♂)	体重 200-220g Wight 200-220 g	月龄 1 M Age 1 moon
	选择实验动物种类和数量的原因 Reasons for the choice of species and numbers of animals to be used. 糖尿病容易引起感染等并发症, 导致模型鼠的死亡。SD 大鼠对疾病的抵抗力较强, 实验使用 SD 大鼠可以减少死亡率, 同时, 也是国际较为通用的糖尿病模型鼠。选择雄性大鼠的原因是雌性大鼠更容易受到雌激素的影响, 而导致造模失败。		

to be used	<p>Diabetes is easy to cause infection and other complications, leading to the death of model mice. SD rats have strong resistance to diseases, and the mortality can be reduced by using SD rats in the experiment. Meanwhile, SD rats are also the international common diabetes model rats. The reason for choosing male rats is that female rats are more easily affected by estrogen, which leads to the failure of modeling.</p> <p>经过统计学分析得到实验所需动物样本量，同时，因为糖尿病大鼠容易死亡，适当扩大了样本量，共计 40 只大鼠。</p> <p>The experimental animal sample size was obtained by statistical analysis. At the same time, because diabetic rats are easy to die, the sample size was appropriately expanded to 40 rats.</p>
拟开展动物实验的详细信息 Detailed information of the experiments on animals	<p>详细列出对动物可能造成的所有可预期的伤害，包括动物运输、每个实验方案动物饲养方式、实验操作步骤中等可能产生伤害或不适的细节以及拟采取的防控措施</p> <p>Description of the overall harms expected to be experienced by the animals-including details of the likely adverse effects of each protocol, cage breeding and the steps which will be taken to control these adverse effects</p> <p>(1) 大鼠养殖：每笼大鼠过多，垫料潮湿，导致生病死亡。措施：每笼大鼠控制在 7 只，垫料每日更换，避免感染。</p> <p>(2) 大鼠造模：腹腔注射链脲佐菌素，注射部位可能感染和出血。措施：采取皮肤消毒和压迫止血，注射尽量远离腹股沟髂血管区并倾斜 45° 入针，注射后消毒。</p> <p>(3) 尾静脉采血测血糖：大鼠尾静脉采血可能感染和出血。措施：采取皮肤消毒和压迫止血，取血采用专用一次性采血针头，一鼠一针。</p> <p>(4) 大鼠麻醉：每次 MR 扫描前需要麻醉，麻醉可能药物剂量过度，导致大鼠死亡。措施：在标准麻醉剂量上每次适当减量注射麻醉药物。</p> <p>(1) Cage breeding: If the rats in each cage were too much, and the bedding material was moist, the rats would suffer from illness and death. Measures: Each cage contained 7 rats and cushion material should be changed every day to avoid infection.</p> <p>(2) Rat model establishment: If streptozotocin is injected intraperitoneally, the injection site may be infected and bleeding. Measures: To avoid this situation, skin disinfection and compression hemostasis were adopted. Try to keep the injection away from the iliac artery and the needle was inserted at an angle of 45 degrees, then disinfection after injection.</p> <p>(3) Blood glucose was measured from tail-tip blood samples: Blood was collected from tail vein to measure blood glucose, and the injection site may be infected and bleeding. Measures: To avoid this situation, skin disinfection and compression hemostasis were adopted. Special disposable blood collection needle was used for blood collection.</p> <p>(4) Anesthesia in rats: Anesthesia is required before each MR scan. Anesthesia may cause the death of rats by overdose of drugs. Measures: Based on the standard anesthetic dosage, the injection of narcotic drugs should be appropriately reduced each time.</p>
拟开展动物实验的详细信息 Detailed information of the experiments on animals	<p>主要观察指标</p> <p>Main observation target</p> <p>血糖水平；水迷宫实验：游泳距离、时间；海马脑灌注流量；海马 VEGF 表达水平</p> <p>Blood glucose level; Morris water maze (MWM): the escape latency and traveled distance were recorded; The cerebral blood flow of hippocampus; VEGF expression of hippocampus.</p>
拟开展动物实验的详细信息 Detailed information of the experiments on animals	<p>仁慈终点或实验终结的指标</p> <p>Humane endpoint or experimental terminative indicator</p> <p>大鼠注射 STZ15 周后进行 MR 扫描及取材。</p> <p>MR scanning and sampling were performed (15 weeks after STZ injection) .</p>
拟开展动物实验的详细信息 Detailed information of the experiments on animals	<p>动物处死方法</p> <p>Death conduct</p> <p>腹腔注射过量的水合氯醛麻醉处死。</p>

	<p>The rats were sacrificed with an overdose of chloral hydrate.</p> <hr/> <p>非处死动物的处置方式 Not for the death of the animal disposition</p> <p><input type="checkbox"/> 继续使用 <input type="checkbox"/> Continue to use</p> <p><input type="checkbox"/> 保存的机构 <input type="checkbox"/> Save in the agency</p> <p><input type="checkbox"/> 放生野外 <input type="checkbox"/> Release to the wild</p> <p><input type="checkbox"/> 其他, 详细说明 <input type="checkbox"/> Others, detailed description</p> <hr/> <p>动物替代、减少动物用量、降低动物痛苦伤害的主要措施 Major measure for 3Rs</p> <p>计算样本量, 尽量减少动物用量; 干净的水和垫料; 过量麻醉处死。 The sample size was calculated to minimize the number of animals; Clean water and bedding; They were executed under excessive anesthesia.</p> <hr/> <p>是否使用有毒(害)物质(感染、放射、化学毒、其他) Poisonous (harmful) material (infection, radiate, chemical poison and other) being used</p> <p><input type="checkbox"/> 否 no <input checked="" type="checkbox"/> 是 yes</p> <p>说明: 为了诱导糖尿病, 需要腹腔注射链脲佐菌素, 损毁部分胰岛 B 细胞。 Declare: In order to induce diabetes, it is necessary to inject streptozotocin intraperitoneally to destroy part of islet B cells.</p>
	<p>利害分析的小结, 说明为何预期的利益多于害处? A summary of the harm-benefit analysis -why the expected benefits might be considered to outweigh the predicted harms?</p> <p>在动物实验的基础上, 明确基于 3D-ASL 脑灌注成像与糖尿病导致认知异常相关性, 证实 MR 灌注成像是一种无创发现糖尿病导致认知异常的影像生物学标记。探讨糖尿病导致认知障碍的原因, 为临床治疗认知障碍提供思路和途径。 based on animal experiments, to clarify the correlation between 3D-ASL based cerebral perfusion imaging and diabetes induced cognitive impairment, and confirmed that MR perfusion imaging is an imaging biomarker for noninvasive detection of cognitive abnormalities caused by diabetes mellitus. To explore the causes of cognitive impairment caused by diabetes mellitus, and to provide ideas and approaches for clinical treatment of cognitive impairment.</p>
	<p>相关的补充说明或辅助证明文件 Supplementary instruction or any auxiliary documents for investigate</p> <p>无 No.</p>
	<p>信息公开和保密要求: 说明哪些信息需要保密, 哪信息可以公开 Declaration for the information disclosure and confidentiality requirements, declaring the information need to be kept secret, the information can be disclosed.</p> <p>公开。所有的结果和数据。 Open. Publish all results and data.</p>

对伦理委员有无回避要求

Claiming jurors for being debarb.

无

No

声明:1.我将自觉遵守实验动物福利伦理相关法规和各项规定, 同意接受伦理委员会和实验
物室管理者的监督与检查

2.本人保证本申请表中所填内容真实、详尽和易懂

Declaration: 1. I will abide by the law and regulation stipulation, and accept the supervision and in-spection by the
committee laboratory animal department.

2. The information I have given is accurate detailed and comprehensive.

声明人: 课题负责人签(章) 邵举薇

Declarant: Signature (stamp) of PI

动物实验负责人签(章) 邹英鹰

Signature (stamp) of Director of animal experiment

2019年9月20日

Y M D

申报部门意见

Opinion of applicant Depatment of institution

同意

实验室负责人签(章): 邹英鹰

Signature (stamp) of the Department principal

2019年9月20日

Y M D

主管医师意见

Opinion of Veterinary of institution

同意

主管医师签(章): 刘江

Signature (stamp) Veterinary

2019年9月20日

Y M D

实验动物设施意见

Opinion from laboratory animal facility

同意



设施负责人签(章):
Signature (stamp) of the facility Director
2019年9月30日
Y M D

实验动物伦理委员会审批意见
Approval opinion of Committee

同意

审查委员表决

Inspection by members: Agree(☒); Disagree (☐)



主任委员签(章):
Signature (stamp) of Chairman of Committee
2019年9月30日
Y M D

备注: ☒ 初审

☐ 第 次审查

Remarks: ☐ first trial

☐ reexamine No.

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