

# FAQ - Basic Research

## 疑难解答—基础研究

### Microdialysis Technique

#### 微透析技术

<b>Question:</b>	What is recovery? 什么是回收率？
------------------	------------------------------

**Answer:** The recovery of a particular substance is defined as the concentration in the dialysate expressed as percent of the concentration in the interstitial fluid.

特定物质的回收率用该物质在透析液中浓度与组织液中浓度的百分比来表示。

<b>Question:</b>	How does the length of the membrane affect the recovery? 膜长度对回收率的影响？
------------------	---

**Answer:** A longer membrane and a lower flow rate will give a higher recovery.

膜越长，流速越低，回收率越高。

<b>Question:</b>	How shall the perfusion fluid be composed? 灌流液应如何配制？
------------------	---

**Answer:** Ideally it should be as close as possible to the composition of the extracellular fluid. However, you may want to change the concentration of sodium, potassium or calcium in order to influence the membrane function in the region you are studying. CMA can offer Perfusion Fluid T1 for peripheral tissue and Perfusion Fluid CNS for brain tissue.

理想情况下，灌流液应尽可能接近细胞外液的成分。然而，你可能想改变钠、钾或钙的浓度，以影响你所研究的区域的膜功能。CMA 可提供外周组织灌流液 T1 和中枢神经系统脑组织灌流液。

<b>Question:</b>	What is the pH of the CNS perfusion fluid? 中枢神经系统灌注液的 pH 是多少？
------------------	--

**Answer:** The CNS perfusion fluid is intentionally not buffered in order to allow it to take on the same pH as the brain's interstitial fluid. The pH of a non-buffered solution varies between 5-8.

为了与脑组织液具有相同的 pH 值，中枢神经系统灌流液是非缓冲溶液。故其 pH 值在 5-8 之间。

**Question:** How does the pH of the CNS perfusion fluid impact the tissue?  
中枢神经系统灌流液的 pH 值如何影响组织的？

**Answer:** Since our perfusion fluid is unbuffered it can hardly itself impact the pH in the tissue. The perfusate will take on the same pH as the surrounding tissue. But the buffered substances in the tissue can have different recovery over the membrane which indirectly can have a small effect on the pH of the tissue.

由于我们的灌流液是没有缓冲作用，所以它不会影响组织中的 pH 值。灌流液的 pH 值与周围组织的 pH 值相同。但是，膜对组织中的缓冲物质有不同的回收率，会对组织的 pH 值产生很小的影响。

**Question:** If the cut-off of the probe membrane is 20,000 Daltons, why do I not have 100% recovery for molecules of 20,000 Daltons?  
如果探针的最大截留量是 20000 道尔顿，为什么分子量是 20000 道尔顿的物质的回收率不是 100%？

The ability of molecules to pass the membrane decreases logarithmically with the increase in molecular weight. By experience we know that most substances with a molecular weight up to 5,000 Da can be dialyzed when using a 20,000 Da membrane. This is of course very dependent on the substance and the sensitivity of the analytical method.

**Answer:** 北京铭泰佳信科技有限公司  
分子透过膜的能力随着分子量的增加而呈对数减少。根据经验，我们得知，当使用最大截留量是 20000 道尔顿的膜时，大多数分子量高达 5000 道尔顿的物质可以被透过，这种情况完全依赖于分析方法的实质和灵敏度。

## Probes

### 探针

**Question:** Which length of the microdialysis probe membrane shall I use?  
微透析探针的膜的长度有哪些？

**Answer:** A longer membrane gives a better recovery of the substances you are interested in but the choice is usually limited by the size of the structure you want to study.  
CMA can offer a variety of probes with different membrane lengths from 1mm to 10 mm suitable for most experiments.

膜越长，你所研究的物质的回收率越高，但可选性通常受限于你所研究物质的结构大小。

CMA 可以提供多种探针，膜长度从 1 mm 到 10 mm，适用于大多数实验。

<b>Question:</b>	Which membrane material is to be recommended? 怎样选择膜材料？
------------------	---

**Answer:** A membrane with low cut off purifies your sample by excluding large molecules. A membrane with high cut off recovers large substances such as peptides or smaller proteins. Note that some substances can also bind to the membrane material. To optimize your choice you should make an in vitro test with the substance you want to monitor. CMA can offer membranes made of PAES, polyarylethersulfone, 20,000 Daltons, cuprophane, 6,000 Daltons and PES polyetersulfone, 100,000 Daltons cut-off.

低截留量的膜可以通过排除大分子物质来净化你的样本，高截留量的膜可回收大物质，如肽或较小的蛋白质。需要注意的是有些物质可以和膜材料结合。为了优化你的选择，应该用你想要检测的物质做体外试验。

CMA 可提供 PAES（聚芳醚砜膜），截留量是 20000 道尔顿，铜纺膜，截留量是 6000 道尔顿和 PES（聚醚砜膜），截留量是 100000 道尔顿。

<b>Question:</b>	You have a number of different Microdialysis probes? How shall I choose the right one for my experiment? 您这里有很多种不同的微透析探针，如何就我的实验选择合适的探针？
------------------	---

**Answer:** There are of course many aspects which determines the choice. This is a brief overview, for more information see our catalog or product information on CMA web pages.

A stiff probe is suitable for a stereotaxic experiment on the brain while a flexible probe may be suited for microdialysis in a peripheral organ such as adipose tissue, muscle, liver or kidney.

CMA 12 the optimized probe for CNS use, ideal for chronic implantation

CMA 11 a thin stiff probe for discrete brain regions

CMA 7 an extremely small stiff probe for CNS studies in smaller animals such as mice

CMA 20 a soft non-metallic probe for peripheral tissues and blood vessels

CMA 30 a linear probe suitable for skin and other peripheral tissues

CMA 31 a linear probe suitable for skin and other peripheral tissues with 55k Da cut-off

当然，有很多因素决定了选择的方向。这里提供一个简短的概述，更多的信息可在 CMA 网页上查看我们的目录或产品信息。

硬质探针适用于大脑立体定位实验，而柔韧的探针则适用于脂肪组织、肌肉、肝脏或肾脏等外周器官的微透析实验。

CMA 12 是一种用于中枢神经系统研究的最佳探针，可长期植入。

CMA 11 是一种用于离散大脑区的一种细硬质探针。

CMA 7 是一种非常小的硬质探针，适用于小动物如小鼠的中枢神经系统研究。

CMA 20 是一种软性的非金属探针，适用于外周组织和血管。

CMA 30 是一种适用于皮肤和其他外周组织的线性探针。

CMA 31 是一种适用于皮肤和其他外周组织的线性探针，其分子截留量是 55000 道尔顿。

Question:	What perfusion flow rate should be used? 灌流液的流速是多少？
Answer:	<p>A high flow rate if you want to remove or introduce as many molecules as possible per time unit.</p> <p>A low flow rate should be used when you want to obtain a more concentrated dialysate (high recovery). Note that a low flow rate gives smaller volume. Consider also the volume needed for the analysis.</p> <p>如果你想在单位时间内去除或引入尽可能多的分子，应选用高流速。如果你想获得高浓度的透析液（高回收率），应选用低流速。但需要注意的是低流速收集的体积较小，因此在选用流速时还要考虑分析所需的体积。</p>
Question:	What time is needed to obtain steady state conditions? 什么时候才能达到稳态平衡？
Answer:	<p>The introduction of a probe into the tissue will always cause damage and the recovery of function will take a certain time period. An hour is often used to reach “baseline conditions”.</p> <p>当植入探针时会对组织造成一定的伤害，因此需要一段时间进行修复。通常灌流一个小时可达到“基线条件”。</p>
Question:	Are the probes reusable? 探针可以重复使用吗？
Answer:	<p>The preclinical probes can be used repeatedly if rinsed and stored in deionized water between experiments. However CMA can only guarantee single usage.</p> <p>实验中临床前研究使用的探针若清洗后储存在去离子水中，可以重复使用。但是，CMA 仅能保证可供一次使用。</p>

**Question:** When do I need the guides?  
什么时候需要探针导管？

**Answer:** Guides are used when you shall perform Microdialysis in the brain of a freely moving animal.

在做动物清醒状态下的脑部微透析实验时，需要使用探针导管。

**Question:** How do I handle FEP tubing and Tubing adapters?  
怎样连接微透析管路和管路接头？

When using a FEP tubing you shall cut the tubing with a sharp scalpel or similar to be sure the ends are open. After use rinse it with de ionized water to wash out the salts.

Tubing Adapters can be swelled in 70% ethanol for easy connections with tubing and syringes. They will shrink back in air again and ensure tight fit and zero internal volumes.

**Answer:** 当使用 FEP 管道时，你应该用锋利的手术刀或类似的物件来切割管路，以确保末端是开放的。使用后用去离子水将残留的盐冲洗干净。

为了便于与管路和注射器连接，可将管路接头在 70%的乙醇中膨胀。管路接头在空气中会再次收缩，以确保连接的紧密性以及内部体积为零。

**Question:** I get faulty flow. What have I done?  
获得的流量是错误的，可能原因是什么？

Maybe you have not calibrated the pump to the syringe you are using.  
The syringe can be leaking or you are not using the syringe recommended by CMA.

**Answer:** 可能没有用你使用的注射器校准泵。

注射器可能渗漏，或者没有使用 CMA 推荐的注射器。

**Question:** Why do I get faulty volume of my microdialysis sample?  
收集的微透析样品量有问题的原因是什么？

**Answer:** The probe may be leaking, the tubing may be blocked, something may be wrong with the pump, or the tubing adapters may be leaking.

原因可能是：探针漏液，管路被堵塞，泵可能出了问题，或者管路接头漏液。

## Instruments

**Question:** What is the difference between the CMA 400 pump and the CMA 402 pump?  
CMA400 与 CMA402 区别有哪些？

**Answer:** CMA 400 has a pulse free flow from 1 nL/min - 1 mL/min, runs four syringes simultaneously. The pump is calibrated for various sizes of syringes. Apart from

microdialysis experiments, it can be used for microinjections of preset volumes that can be repeated in intervals.

CMA 402 has flow rates between 0,1µL - 20 µL/min, run by two syringes individually (1, 2.5 or 5 ml) . Start/stop and flow rate can be set independent for each syringe.

Both pumps can be used as both push and pull option.

CMA 400 无脉冲，流速控制范围是 1 nL/min - 1 mL/min，同时控制 4 个注射器。这个泵是根据不同大小的注射器进行校准的。除了适用于微透析实验外，还可用于一定间隔的重复的预定量的微量注射。

CMA 402 的流速控制范围是 0.1µL - 20 µL/min，两个注射器单独运行(注射器可选 1mL, 2.5mL 或 5mL)。每个注射器的启动/停止和流速可单独设置。

这两种泵都具有“推”、“拉”的双向能力。

<b>Question:</b>	<p>What is the difference between CMA 142 and CMA 470 Fraction Collectors?</p> <p>CMA 142 和 CMA 470 微量收集器的区别有哪些？</p> <p>The CMA 142 collects fractions from 1 probe, 20 fractions or from 2 probes, 10 fractions. Fraction volumes from 1uL - 50 uL in open vials.</p> <p>CMA 470 is a refrigerated fraction collector, can collect 64 fractions from 1 up to 4 probes simultaneously (16 fractions/probe = 64 total). Fraction volumes from 1 uL - 2000 uL.</p> <p>Both opened and seal vials can be used.</p>
<b>Answer:</b>	<p>CMA 142 收集的样品量是 1 个探针，20 个收集瓶；或者 2 个探针，10 个收集瓶。透析液存储在开口小瓶，其体积范围是 1uL - 50 uL 。</p> <p>CMA 470 是低温微量收集器，可同时收集 1-4 个透析液，共收集 64 个样品。（每个探针收集 16 个样品，共 64 个）。透析液可存储在开口小瓶或密封小瓶中，其体积范围是 1 uL - 2000 uL</p>
<b>Question:</b>	<p>When shall the CMA 150 be used?</p> <p>CMA 150 什么时候使用？</p>
<b>Answer:</b>	<p>The CMA 150 keeps a stable temperature of the animal during an anesthetized microdialysis study. This ensures a better quality of your study.</p> <p>在微透析研究中 CMA 150 可维持麻醉动物的体温恒定，确保实验的准确性。</p>
<b>Question:</b>	<p>What is the use of a CMA 120 System for Freely Moving Animals?</p> <p>CMA 120 清醒活动系统的作用是什么？</p>
<b>Answer:</b>	<p>This system enables Microdialysis studies on conscious, small laboratory animals over a long period of time. It can be used in combination with any one of CMA's preclinical</p>

instruments.

清醒动物活动系统可对小型实验动物在其清醒状态下进行长时间的微透析采样实验。它可与 CMA 的任何一种临床前实验仪器结合使用。

北京铭泰佳信科技有限公司