第一页：

首先，对于这个生物我期望能有基本的生命形态，对于外界得一些主动干预，和环境变化能做出符合生物规律的反应。并且,不断有规律的繁殖，生成新的细胞或组织。因为一个基本的生物应当具有以上特点。右侧的两张图片选自电影life，展示的是电影中提到的外星生物。最开始，我对于目标只有小部分的构思。当看到电影中外星人的形态后，我的目标逐渐成熟。Organism拥有这个外星人的部分特征，例如都是通过一个生物核心向四周逐渐均匀的生成新细胞，并且移动的形态富有生物的协调性。

Firstly, I hope that this organism can have a basic life form, actively intervene in external factors, and respond to environmental changes in accordance with biological laws. And continuously reproduce in a regular manner, generating new cells. Because a basic organism should possess the above characteristics. The two pictures on the right are taken from the movie Life and show the extraterrestrial creatures mentioned in the movie. At first, I only had a small idea of the goal. After seeing the alien form in the movie, my goal gradually matured. Organism possesses some of the characteristics of this alien, such as the gradual and uniform generation of new cells through a biological core, and the coordinated movement of the cells. But it has no attacking type and can only survive in liquids.

第二页：

在最终成果中，我达到了一些目标。首先，它较好的模拟了生物的特征，包括运动协调性，繁殖与衰退，和对外界的变化做出相应的回应。其次，能够运用一些手段实现了较复杂的运动模式，例如具有生物特性的波动和模拟液体中移动的速率。当然，开发过程中遇到了一些困难。在起初，生成的细胞无论在数量还是位置都不受控制，导致视觉效果很差，需要长代码来控制生成效果。并且基础的代码在某些时候难以模仿电影中生物的运动形式，只能通过简单代码的堆砌初步达到效果。这些困难在最终得到了较为合适的解决，但仍有很大的进步空间。具体来说，这个生物还需要拥有更多的生物特性，例如细胞的合并和分裂。其次，生物与外界的沟通和互动需要增加，例如一些交流，或者化学物质的释放。并且生物的视觉效果可以更优化，让观众直观的看到它的结构，生存环境。

In the final outcome, I achieved some goals. Firstly, it simulates the characteristics of organisms well, including coordination of movement, reproduction and decline, and corresponding responses to external changes. Secondly, some means can be used to achieve more complex motion patterns, such as waves with biological characteristics and simulating the speed of movement in liquids. Of course, there were some difficulties encountered during the development process. At the beginning, the generated cells were not controlled in terms of quantity and location, resulting in poor visual effects and requiring long code to control the generation effect. And at times, the basic code is difficult to imitate the movement of creatures in movies, and can only achieve preliminary results through the stacking of simple code. These difficulties were eventually resolved , but there is still a lot of room for improvement. Specifically, this organism needs to possess more biological characteristics, such as cell merging and division. Secondly, communication and interaction between organisms and the outside world need to be increased, such as some exchanges or the release of chemicals. And the visual effect of the organism can be optimized, allowing the audience to intuitively see its structure and living environment.

第三页：

对于代码中的一些亮点或值得关注的地方，我想有两点要提到。第一，是波纹的形成。在考虑点击画板空白产生波纹时花了一些时间，设置波纹的半径为radius，用lifetime表示其寿命。每次调用expand扩展波纹时，波纹半径增加2，同时lifetime减少。Stroke中随着lifetime减少，颜色逐渐变淡。当lifetime小于等于0时，不再绘制。

For some highlights or noteworthy areas in the code, I would like to mention two points. Firstly, it is the formation of ripples. It took some time to consider creating ripples when clicking on the blank canvas. I set the radius of the ripples and used lifetime to represent their lifespan. Every time expand is called to extend the ripple, the ripple radius increases by 2 and the lifetime decreases. As the lifespan of Stroke decreases, the color gradually fades. When lifetime is less than or equal to 0, no longer draw.

另一个是对当生物核心移动后，生成的细胞对其追随效果的构建。起初构思的效果是用一个判断生物核心和细胞之间距离的语句，当距离超过某个数时细胞会出现在核心的周围，但最终效果是瞬间消失和出现，违背规律。因此，我用一个很小的系数来控制细胞移动的速度，达到了细胞被核心牵引缓慢前进的效果，能模拟生物力学特性，充满有机感。

Another is the construction of the following effect of cells generated when the biological core moves. The initial idea was to use a statement to determine the distance between the biological core and cells. When the distance exceeds a certain number, cells will appear around the core, but the final effect is to disappear and appear instantly, violating the rules. Therefore, I used a very small coefficient to control the speed of cell movement, achieving the effect of cells being slowly pulled forward by the core, which can simulate biomechanical properties and is full of organic feeling.