ABSTRACT

A model via de Bruijn graph is constructed on predicting the persistency and permanency properties of two stages deoxyribonucleic acid (DNA) splicing system. This model works as well as a user friendly interface (UI) that is developed via Microsoft Visual C# Sharp (C#). In biological point of view, this model will optimize time and money on predicting the persistency and permanency of the existence or new hybrid molecules of DNA in the experimental recombination process. This model works up to two stages DNA splicing system and mathematically developed based on Yusof-Goode (Y-G) approach.

Keywords: de Bruijn Graph, Persistency, Permanency and Yusof-Goode (Y-G) Splicing System

1. INTRODUCTION

1. The persistency of the DNA splicing system can be simply determined.
2. In the future, this model will lead to determine the 'target' traits in DNA sequence.

3. OBJECTIVE

To describe and model the two stages DNA splicing system via de Bruijn graph.

3.1 NOVELTY/ INVENTIVENESS/ METHODOLOGY

A graph model that works on predicting the persistency and permanency of two stages DNA splicing system.

Table 1: Novelty of Innovation

<table>
<thead>
<tr>
<th>No.</th>
<th>Year</th>
<th>Researcher</th>
<th>Finding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1978</td>
<td>Head, T.</td>
<td>Introduce the mathematical theory and pseudo of persistent (focus on crossing site only).</td>
</tr>
<tr>
<td>3</td>
<td>2013</td>
<td>Karimi, F.</td>
<td>Introduce sufficient condition for persistent splicing system and proof of the persistency of same splicing system conducted in different phase via experiment.</td>
</tr>
<tr>
<td>4</td>
<td>2014</td>
<td>Mudaber, M.H et. al</td>
<td>Introduce some characteristics of persistent splicing system based on four factions: number of crossing site, crossing site and left &amp; right context of restriction enzyme up to two stages.</td>
</tr>
<tr>
<td>5</td>
<td>2014</td>
<td>Yusof, Y et. al</td>
<td>Predicting the persistency and permanency of splicing system via de Bruijn graph, the recombinant DNA strands are persistent, because they can cut again by the restriction enzyme.</td>
</tr>
</tbody>
</table>

4. BENEFITS

1. Optimize time and money in handling the experiments.
2. Solve the problem on predicting the behaviour of DNA recombinant.

5. MARKETABILITY/ COMMERCIALIZATION/ POTENTIAL MARKET

1. This development will further benefit the field of biomathematics and bio-molecular computing in Malaysia as a basic in devising new techniques of DNA splicing system or commercialization purposes. For example, as a program that can add-on in the New England Biolabs (NEB) tools.

6. ACHIEVEMENTS

1. Solve the problem on predicting the behaviour of DNA recombinant.
2. Optimize time and money in handling the experiments.

7. RESULTS

A flowchart for research methodology.

Figure 1: Test Tube of Recombination Process

Figure 2: Flowchart for Research Methodology

Figure 3: Predicting the Persistency & Permanency of Two Stages DNA Splicing System (Persistency, Permanency)

As a conclusion, this system works on predicting the persistency and permanency of DNA splicing system which is applicable in DNA recombination process.

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