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The pLoc_Bal-Mplant is a Powerful Artificial Intelligence Tool for Predicting the Subcellular Localization of Plant Proteins Purely based on their Sequence Information

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Short Communication

Recently a very useful web-server, or AI (Artificial Intelligence) tool, has been developed for predicting the subcellular localization of plant proteins purely according to their information for the multi-label systems [1], in which a same protein may appear or travel between two or more locations and hence its ID (identification) needs two or more labels as well, namely the "multi-label mark" [2].

The AI tool is named as "pLoc_bal-mPlant", where "bal" stands for that the AI tool has been treated by balancing out the training dataset [3-9], and "m" for that the AI tool can be used to investigate into the multi-label systems. Below, let us show how the AI tool is working.

Clicking the link at http://www.jci-bioinfo.cn/pLoc_bal-mPlant/, you will see the top page of the pLoc_bal-mPlant web-server prompted on your computer screen (Figure 1). Then, just doing what the Step 2 and Step 3 say in [8], you will see Figure 2 on the screen of your computer. You can see from there: nearly all the success rates achieved by the AI tool for the plant proteins in each of the 12 subcellular locations are within the range of 97-100%. Such a high prediction quality is far beyond the reach of any of its counterparts.

In addition to the advantages of high accuracy and easy to use, the AI tool has been constructed by strictly complying with the "Chou's 5-steps rule" and hence possesses the following terrific merits as concurred by many investigators ([10-91] as well as three comprehensive review papers [2,92,93]): (1) crystal clear in logic development, (2) completely transparent in operation, (3) easily to repeat the reported results by other investigators, (4) with high potential in stimulating other sequence-analyzing methods, and (5) very convenient to be used by the majority of experimental scientists.

For the wonderful and awesome roles of the "5-steps rule" in driving proteome, genome analyses and drug development, see a series of recent papers [2,93-102] where the rule and its wide applications have been very impressively presented from various aspects or at different angles.

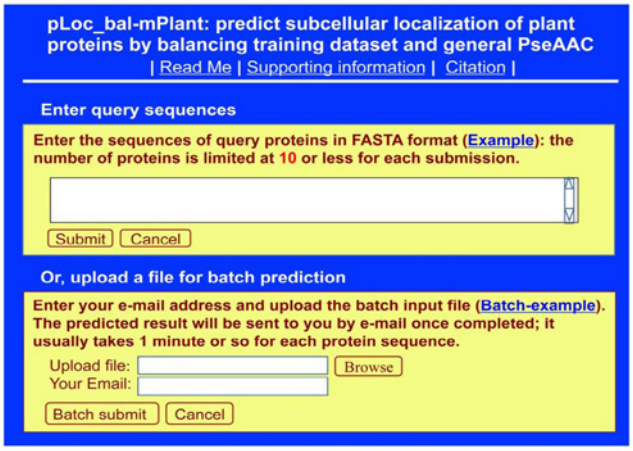

Figure 1: A semi screenshot for the top page of pLoc_bal-mPlant (Adapted from [8] with permission).

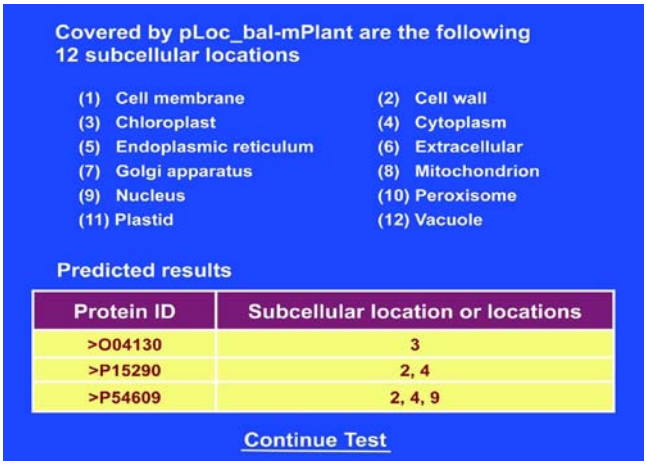

Figure 2: A semi screenshot for the webpage obtained by following Step 3 of Section 3.5 (Adapted from [8] with permission).

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