Identification of SNP-SNP interaction for chronic dialysis patients

Cheng-Hong Yang, Zi-Jie Weng, Li-Yeh Chuang, Cheng-San Yang

www.elsevier.com/locate/cbm

PII: S0010-4825(17)30041-0
DOI: http://dx.doi.org/10.1016/j.compbiomed.2017.02.004
Reference: CBM2597

To appear in: *Computers in Biology and Medicine*

Received date: 10 October 2016
Revised date: 14 February 2017
Accepted date: 15 February 2017

Cite this article as: Cheng-Hong Yang, Zi-Jie Weng, Li-Yeh Chuang and Cheng-San Yang, Identification of SNP-SNP interaction for chronic dialysis patients *Computers in Biology and Medicine* http://dx.doi.org/10.1016/j.compbiomed.2017.02.004

Identification of SNP-SNP interaction for chronic dialysis patients

Cheng-Hong Yang [a], Zi-Jie Weng [a], Li-Yeh Chuang [b*] , Cheng-San Yang [c*]

[a] Department of Electronic Engineering, National Kaohsiung University of Applied Sciences, No.1, Sec. 1, Syuecheng Rd., Dashu District, Kaohsiung City 84001, Taiwan.

[b] Department of Chemical Engineering & Institute of Biotechnology and Chemical Engineering, I-Shou University, No.415, Jiangong Rd., Sanmin Dist., Kaohsiung City 807, Taiwan.

[c] Department of Plastic Surgery, Ditmanson Medical Foundation Chia-Yi Christian Hospital, Chiayi 60002, Taiwan

C-HY: chyang@cc.kuas.edu.tw
Z-JW: dsa0543@hotmail.com
L-YC: chuang@isu.edu.tw

*Corresponding author. Tel.: +886-6151100 ext3421.

ABSTRACT

Analyses of interactions between single nucleotide polymorphisms (SNPs) have reported significant associations between mitochondrial displacement loops (D-loops) and chronic dialysis diseases. However, the method used to detect potential SNP-SNP interaction still requires improvement. This study proposes an effective algorithm named dynamic center particle swarm optimization *k*-nearest neighbors (DCPSO-*K*NN) to detect the SNP-SNP interaction. DCPSO-*K*NN uses dynamic center particle swarm optimization (DCPSO) to generate SNP combinations with a fitness function designed using the *K*NN method and statistical verification. A total of