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Recording the new genes for CCL2, CCL5 and CXCL10 chemokines in cases with neuroinflammation multiple sclerosis

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Abstract

Multiple sclerosis (MS) is the chronic auto-immune, inflammatory neurological illness of the CNS. This brief report was done to discover the new genes for CCL2, CCL5 and CXCL10 in cases with neuroinflammation multiple sclerosis. The new genes for *ccl2*, *ccl5* and *cxcl10* chemokines were

recorded, the results were registered in NCBI under accession numbers (LC727557), (LC727558) and (LC727558) respectively.

Keywords: Multiple sclerosis, inflammatory neurological disease, CCL2, CCL5, CXCL10

Introduction

Chemokines (chemoattractant cytokines) are small basic proteins (large group) with a molecular weight between (8-14 kDa) and are featured by attracting leukocyte into the site of inflammations and infections [1].

Monocyte-derived neutrophil chemotactic factor (MDNCF), is a potential mediators of the leukocyte specific inflammatory responses, which firstly discovered by Yoshimura et al. in 1987 [2]. Now a day, this group has been studied in extensive and > 50 different chemokines have been recorded in humen [3-6].

They play a role in immunity regulations and T-cell polarizations, inductions of respiratory bursts, apoptosis, angiogenesis, mitosis, tumors metastasis, wounds healed and secretions of cytokines and extracellular matrix proteases. The main attractions of MS chemokines are to gaining further insight into lesions evolution, the pathogenesis of diseases and to identifying potential therapeutic targets. However, definitive attributions of pathogenic role for chemokine and receptor in humen CNS disease remain challenge [7]. Based on the knowledge about the diagnostic role of various chemokines that contributes to multiple sclerosis and the dynamic mechanism for its role in the early diagnosis, its hypothesized that: Is a specific chemokines related to the pathogenesis of multiple sclerosis in Iraq such as the presence of chemokine CCL2, CCL5 and CXCL10 with MS.

Methods

The equipment and instruments which were used throughout the study are listed in table (1).

Table 1. The equipment's and instruments used in the study

Item	Description and Company	Country
Butterfly Syringe	**IMPROVE**	**China**
EDTA tube	**APCO**	**Jordan**

Gel tube	**Gongdong**	**China**
Cold rack box	**Biobasic**	**U.K**
Disposable glove	**Care gloves**	**Malaysia**
Centrifuge	**NUVE**	**Turkey**
Eppendorf Tube	**1.5ml, ABDOS**	**India**
Disposable tips	**20,200,1000ml, Citotest**	**China**
Micropipette	**10-1000, Biobase**	**Germany**
Horizontal electrophoresis system	**Mupid-One**	**Japan**
Gradient Thermal Cycler	**T100 Thermal Cycler, BioRad**	**Singapore**
Microcentrifuge	**Mikro 120, Hettich**	**Germany**
Vortex mixer	**LVM-202, DAIHAN**	**Korea**
Water Bath	**LWB-111D, DAIHAN LabTech**	**Korea**
Elisa Reader	**Mindray**	**China**
Distilled water	**Alab Tech**	**Korea**
Incubator	**Memmert**	**Germany**
Microwave Oven	**Panasonic**	**Japan**

The biological materials and all chemicals that were listed in the table (2).

Table 2. The chemical and already prepared solution

Item	Description and Company	Country
1500pb DNA ladder	**Lot: 1101C, Cat. No. D-1030,** **Volume 250 µl, Concentration 135ng/ µl. Bioneer.**	**Korea**

10x TBE (Tris-Borate-EDTA) buffer **1 liter bottle**	**Bio Basic Inc.**	**Canada**
Ethanol	**J.K. Baker**	**Netherland**
Agarose	**Bio Basic Inc.**	**Canada**
Bromophenol blue	**Bio Basic Inc.**	**Canada**
Ethidium bromide (10 mg/ml **Solution)**	**Bio Basic Inc.**	**Canada**
Nuclease free water	**Bioneer**	**Korea**

Ethical approval

Approved by IRB committee of Researches Units, Training and Humanity development Center, Basrah Health directorate and Department of Medicine, University of Basrah / Researches Units, Training and Humanity development Center, Basrah Health directorate (No.109/2021 [479] in 17/11/2021 and No. 855 in 21/11/2021).

Results

The new genes recorded were shown in figure (1), (2) and (3).

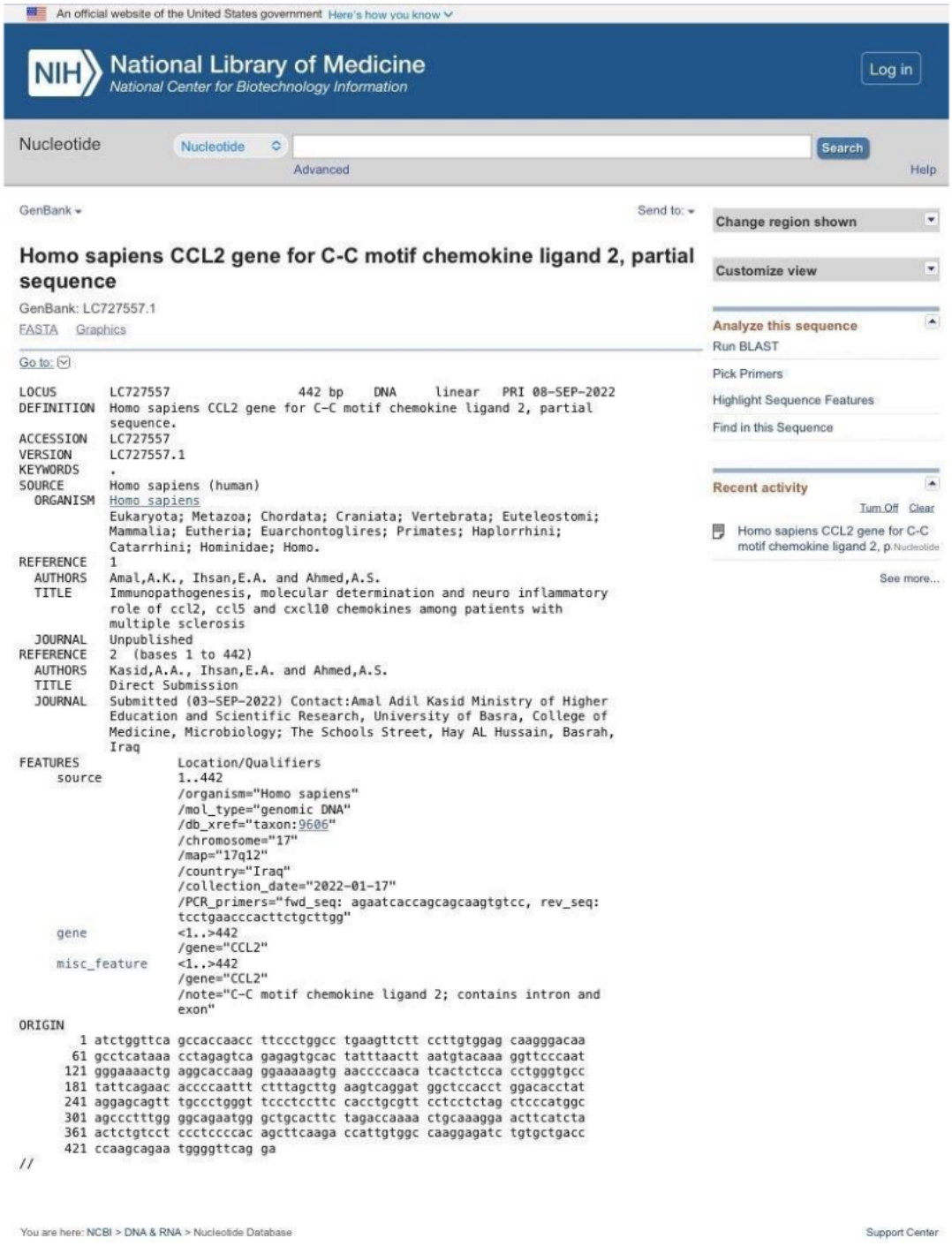

Figure 1. Homo sapiens CCL2 gene for C-C motif chemokine ligand 2.

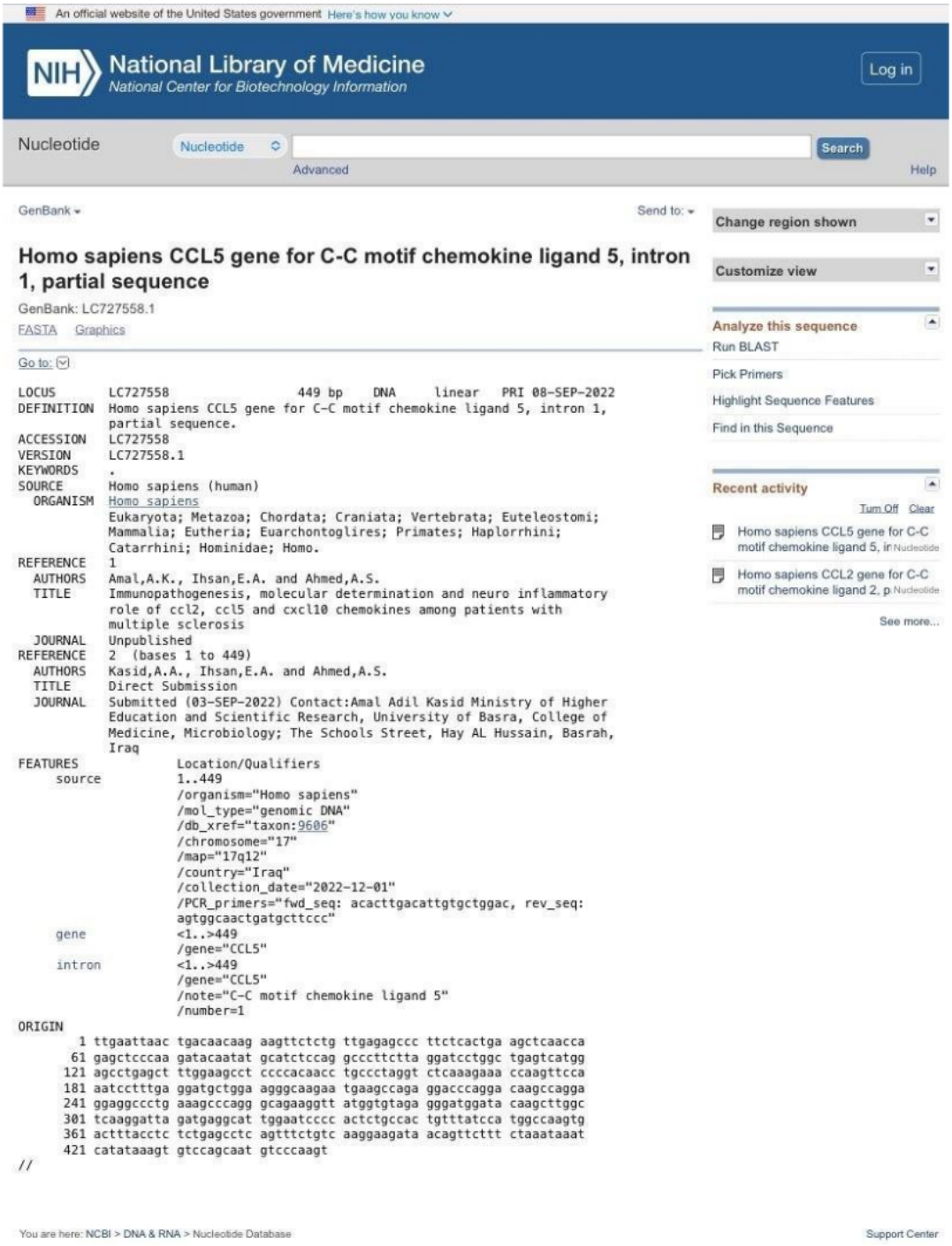

Figure 2. Homo sapiens CCL5 gene for C-C motif chemokine ligand 5.

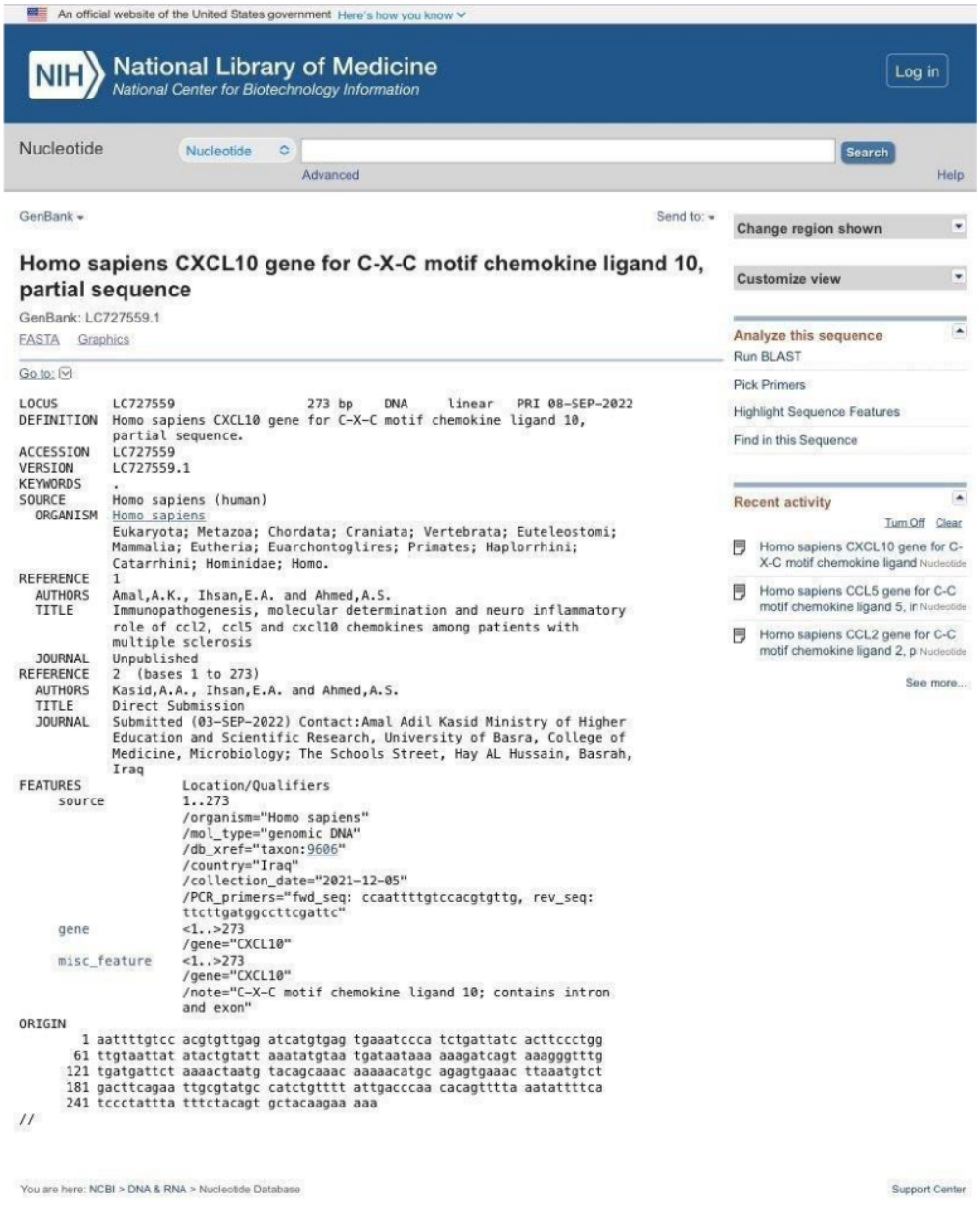

Figure 3. Homo sapiens CXCL10 gene for C-X-C motif chemokine ligand 10.

Discussion

Depending on the no. and spacing of cysteine residues included in the formation of disulfide bonds, the chemokines are categorized into 5 groups, which are: C-C (β-chemokine), C-X-C (α-chemokine), X-C (δ-chemokine (C-subfamily)), C-X-3-C (γ-

chemokine) and C-X chemokines [8-10].

The chemokines of C-C, C-X-C and C-X-3-C families have 4 cysteine, X-C chemokine only have 2. C-C chemokine is the largest group contain 2 adjacent cysteine residues nearing their N-terminus, genes are grouped on chromosome-17 in humen [4-6].

In C-X-3-C and C-X-C chemokines sub-family, there are 1 to 3 additional amino acids (represented 3X or X) separate the 1st 2 of the 4 cysteine residues and most of the C-X-C chemokines are clustered on chromosome-4 in humen. The 5th sub-family C-X chemokine, which has recently been identified in zebra-fish by Nomiyama in 2008, lack one of the 2 N-terminal cysteine residues but retain the 3rd and 4th [2, 10]. Here, these new genes can't be comparison with other works because no data found in literatures when we searching.

Conclusion

New genes for *ccl2*, *ccl5* and *cxcl10* chemokines have been recorded, the results are registered in NCBI under accession numbers (LC727557), (LC727558) and (LC727558) respectively.

Disclosure

None

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None

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