

Amyloid β 1-42 IMR Reagent

REF MF-AB2-0060



For *In Vitro* Diagnostic & Professional Use

Intended Use

The Amyloid β 1-42 (A β 1-42) IMR Reagent is used to quantitatively measure A β 1-42 protein in human fluid specimen, such as plasma. Use A β 1-42 IMR Reagent only with the XacPro-S System (MagQu Co., Ltd.).

Summary & Explanation

Amyloid β (A β or Abeta) denotes peptides of 36–43 amino acids that are crucially involved in Alzheimer's disease as the main component of the amyloid plaques found in the brains of Alzheimer patients. The peptides result from the amyloid precursor protein (APP), which is being cut by certain enzymes to yield A β . One of the most common isoforms is A β 1-42.^{1, 2}

Principles of Test

The Amyloid β 1-42 IMR Reagent is designed for rapid quantifying A β 1-42 protein by Immuno Magnetic Reduction (IMR). We conjugated the antibody on the surface of around 50 nm-in-diameter Fe₃O₄ magnetic particles. When the antibodies on the surface bind with A β 1-42 protein, the magnetic particles form clusters. Therefore, the ac susceptibility (X_{ac}) of magnetic particles would be reduced in the adding ac magnetic field. By measuring the reduction of X_{ac} , we can quantify Tau protein in the sample easily, rapidly, and accurately.³

Reagents

Amyloid β 1-42 IMR reagent4 x 1 mL (50 tests)

Storage Conditions & Stability

Storage reagent at 2–8 °C, the shelf life is 6 months.

Statement of Warnings

1. Do not be frozen.
2. Please keep away from events with strong magnetism.
3. For *in vitro* diagnostic use only.
4. For professional use only.
5. Do not use the reagent when it has leaved 2–8 °C more than 24

hours or it has something precipitated.

Reagent Preparation

Please use the Amyloid β 1-42 IMR reagents at room temperature (15–30°C).

Specimen Collection & Preparation

1. Collect all blood samples by wearing protective equipment and following universal precautions for venipuncture. Whole blood is collected in an EDTA vacutainer blood collection tube (purple top).
2. Invert the tube smoothly 5-10 times and make sure the whole blood specimen is mix well with EDTA.
3. Centrifuge the tube for 15 minutes at 2,500 x g at room temperature to separate the plasma from the blood cells.
4. After centrifugation, plasma is taken by pipetman and start to measure. If the plasma sample is not use immediately, it must equally divide into four 1.5 ml microcentrifuge tubes or other tubes. Plasma specimens are labeled and deep frozen (-20°C or colder) immediately until needed. Avoid repeated freezing or thawing.

Procedure

1. Add 60 μ L sample to glass testing tube.
2. Add 60 μ L magnetic reagent to glass tube, and mix well.
3. Put the glass tube on the measuring site of IMR analyzer.
4. Wait for the end of reaction and read the result.
5. Use the table for converting to the concentration of A β 1-42 as reference.

IMR(%) vs [A β 1-42]

IMR(%)	[A β 1-42] pg/mL	IMR(%)	[A β 1-42] pg/mL
2.05	< 7.53	3.15	736.49
2.07	9.03	3.24	884.73
2.09	10.85	3.33	1062.81
2.11	13.03	3.42	1276.73
2.13	15.66	3.52	1533.71
2.16	18.81	3.62	1842.41
2.18	22.59	3.72	2213.25
2.21	27.14	3.83	2658.72
2.24	32.60	3.95	3193.87
2.27	39.16	4.07	3836.72
2.30	47.05	4.19	4608.97
2.34	56.51	4.31	5536.65
2.38	67.89	4.44	6651.06
2.42	81.55	4.57	7989.77
2.46	97.97	4.70	9597.94
2.51	117.69	4.84	11529.79
2.55	141.38	4.97	13850.49
2.61	169.83	5.11	16638.29
2.66	204.02	5.25	19987.21
2.72	245.08	5.39	24010.20
2.78	294.41	5.53	28842.93
2.85	353.67	5.67	34648.38
2.92	424.85	5.81	41622.34
2.99	510.37	5.95	> 50000
3.07	613.09		

Results

By using XacPro-S, we can get two signals: one is the AC signal before the reaction (Xac_0) and the other is the AC signal after reaction (Xac). Then we can have the IMR (%) through two signal by following function :

$$IMR(\%) = \frac{Xac_0 - Xac}{Xac_0}$$

IMR (%), as functions of A β 1-42 protein concentration $\phi_{A\beta 1-42}$ are explored and are found to follow the logistic function:

$$IMR(\%) = \frac{A - B}{1 + \left(\frac{\phi_{A\beta 1-42}}{\phi_0}\right)^\gamma} + B$$

where A, B, ϕ_0 , and γ are fitting parameters. For A β 1-42, A = 1.91, B = 8.09, ϕ_0 = 14157.7, and γ = 0.49. The concentration of A β 1-42 protein can be available by following equation. And you can find the table for converting to the concentration of A β 1-42 as reference.

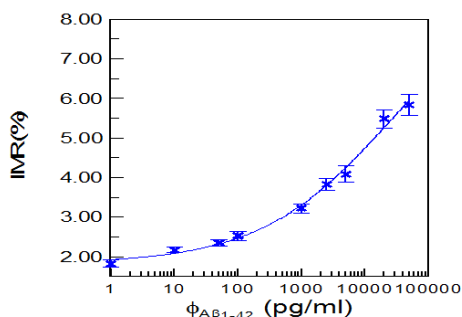


Fig.1 The IMR standard curve of A β 1-42

Limitations

1. The analytical range of reagent is from 7.53 to 50000 pg/mL. When the specimen with A β 1-42 protein > 50000 pg/mL is to be determined, carry out the following procedures to obtain the accurate concentration. Dilute the specimen, re-assay, and multiply the assayed A β 1-42 protein value by the dilution factor.
2. Reagents should be used before the expiration date printed on the kit label.
3. Data is based upon human plasma sample.
4. Do not use the plasma sample when it has leaved -20 °C more than 2 hours or it has something precipitated.
5. Glass testing tubes are single use only.

References

1. M.J. Chiu, S.Y. Yang, T.F. Chen, J.J. Chieh, T.Z. Huang, P.K. Yip, H.C. Yang, T.W. Cheng, Y.F. Chen, M.S. Hua, and H.E. Horng, "New assay for old markers-plasma beta amyloid of mild cognitive impairment and Alzheimer's Disease", Curr. Alzheimer Res. 9,

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2. M.J. Chiu, Y.F. Chen, T.F. Chen, S.Y. Yang, F.P. Gloria Yang, T.W. Tseng, J.J. Chieh, J.C. Rare Chen, K.Y. Tzen, M.S. Hua, and H.E. Horng, "Plasma tau as a window to the brain-negative associations with brain volume and memory function in mild cognitive impairment and early alzheimer's disease", Human Brain Mapping, 15 Oct. (2013).
3. Che-Chuan Yang, Shieh-Yueh Yang, Jen-Jie Chieh, Heng-Er Horng, Chin-Yih Hong, Hong-Chang Yang, K. H. Chen, B. Y. Shih, Ta-Fu Chen, and Ming-Jang Chiu, "Biofunctionalized magnetic nanoparticles for specifically detecting biomarkers of Alzheimer's disease in vitro", ACS Chem. Neurosci. 2, 500 (2011).



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乙型澱粉樣蛋白(Aβ)1-42 磁性試劑

REF MF-AB0-0060



本產品僅供體外診斷及專業用途

目的

乙型澱粉樣蛋白(Aβ)1-42免疫磁減量檢測試劑需搭配 XacPro-S系統 (磁量生技)使用。此試劑用於檢測人類流狀檢體，如血漿之乙型澱粉樣蛋白(Aβ)1-42濃度。

簡介

乙型澱粉樣蛋白(β-Amyloid ; Aβ or A-beta) 是由 36-43 個胺基酸組成的胜肽蛋白，在阿茲海默症病患的大腦會形成病理斑塊堆積，是目前阿茲海默症的主要致病分子之一。此分子是由 amyloid precursor protein (APP)被酵素不正常切割而形成，其中最常見的一種切割後產物即為乙型澱粉樣蛋白(Aβ)1-42。^{1,2}

檢測原理

乙型澱粉樣蛋白(Aβ)1-42 免疫磁減量檢測試劑是利用免疫磁減量平台來快速定量癌胚蛋白濃度。乙型澱粉樣蛋白(Aβ)1-42 抗體接於直徑約 50 nm 的 Fe₃O₄ 磁珠表面。當磁珠表面抗體與癌胚蛋白結合後，磁珠會聚集成較大的分子，磁珠在外加磁場下產生的磁感量會因此減少。透過磁感量的量測，我們可以非常簡單、快速、精確地測得乙型澱粉樣蛋白(Aβ)1-42 濃度。^{3,4}

試劑規格

乙型澱粉樣蛋白(Aβ)1-42 免疫磁減量檢測試劑
4 x 1 mL (50 個反應)

保存條件

請將本試劑保存於 2 ~8 °C，可保存 6 個月。

注意事項

1. 請勿冷凍。
2. 請遠離具有強力磁性物品。
3. 本檢測試劑僅供體外診斷使用。

4. 本檢測試劑僅供專業用途。
5. 如離開保存環境超過 24 小時，請勿繼續使用；當試劑發生沉澱現象，請勿繼續使用。

試劑的準備

使用前請將本產品回復至室溫狀態(15~30 °C)。

樣品的收集

1. 請使用含 EDTA 集血管(紫頭管)採血；採血時請著帶防護配件以及遵守靜脈抽血的標準注意事項。
2. 翻轉集血管 5-10 次，以充分混合血液及 EDTA。
3. 以 2,500 x g 離心集血管 15 分鐘，以分離血漿及血球。
4. 將血漿以吸管吸取至乾淨離心管，儲存於-20 °C 或更低溫度冷凍保存。待使用時取出解凍；血清樣品避免重複冷凍及解凍。

操作步驟

1. 將 60 μL 檢體加入樣品管。
2. 另取 60 μL 檢測試劑加入樣品管。
3. 混合均勻後，將樣品管置於免疫分析儀樣品量測區。
4. 待反應結束後，讀取結果。
5. 將所得的結果對照下表，轉換為乙型澱粉樣蛋白(Aβ)1-42的濃度。

IMR(%) vs [Aβ1-42]			
IMR(%)	[Aβ1-42] pg/mL	IMR(%)	[Aβ1-42] pg/mL
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結果

透過免疫磁性分析儀的量測，我們可以得到反應前的磁性訊號 (Xac_0) 與反應結束後的磁性訊號 (Xac)。藉由反應前後的磁性訊號差異，我們可以得到免疫磁減量(IMR)的結果：

$$IMR(\%) = \frac{Xac_0 - Xac}{Xac_0}$$

免疫磁減量結果再透過 logistic 方程式換算成乙型澱粉樣蛋白($A\beta$)1-42 濃度，方程式如下：

$$IMR(\%) = \frac{A - B}{1 + \left(\frac{\phi_{A\beta 1-42}}{\phi_0}\right)^\gamma} + B$$

乙型澱粉樣蛋白($A\beta$)1-42標準式中， $A = 1.91$, $B = 8.09$, $\gamma = 0.49$ 及 $\phi_0 = 14,157.7$ 。依此方程式，可以將IMR值轉換成乙型澱粉樣蛋白($A\beta$)1-42濃度值。請參照對照表轉換IMR檢測值為乙型澱粉樣蛋白($A\beta$)1-42濃度值。

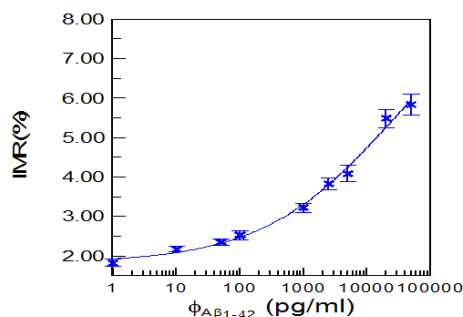


圖.1乙型澱粉樣蛋白($A\beta$)1-42的免疫磁減量標準曲線

產品限制

1. 本產品適用的濃度分析範圍為 7.53 – 50,000 pg/mL。當檢測結果大於 50,000 pg/mL 時，請稀釋檢體至適用範圍並再次檢測。
2. 試劑請在瓶身標示之有效期限內使用方能達到最佳的效果。
3. 本產品僅適用於人類血漿。
4. 當血漿檢測樣品離開-20 °C超過 2 小時，或是樣品中有明顯沉澱物品時，請勿繼續使用。
5. 玻璃樣品檢測管僅限單一次使用。

參考文獻

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4. Che-Chuan Yang, Shieh-Yueh Yang, Jen-Jie Chieh, Heng-Er Horng, Chin-Yih Hong, Hong-Chang Yang, K. H. Chen, B. Y. Shih, Ta-Fu Chen, and Ming-Jang Chiu, "Biofunctionalized magnetic nanoparticles for specifically detecting biomarkers of Alzheimer's disease in vitro", ACS Chem. Neurosci. 2, 500 (2011).



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