Point of care devices to determine & quantify tumor metastasis of thyroid cancer

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Technology

Prof. Marks and Dr. Yoel developed point-of-care methods for determination and quantification of biomarkers for thyroid cancer metastasis. Currently the common procedure is physician performing biopsy in patients that there is suspicion for metastasis. The biopsy is being sent to the lab for diagnosis, procedure that take weeks. Here the researchers developed two point of care method to diagnosis. The first is based on the well-known lateral flow assay (LFA) to detect the presence of metastasis thyroid cancer (yes/no answer). The second is based on capture flow immune-assay (CFA), a novel method that was developed in the laboratory of Prof. Marks. The later device can detect and internally quantify the relevant biomarkers without the need for dedicated signal reader. The main biomarker used was thyroglobulin that is used to diagnose the lymph nodes metastases. The antibodies for thyroglobulin were screened and their stability was measured. The stability was then increased and optimized for the capture of thyroglobulin in the CFA device. They have reached the proposed detection limit needed. Over 70 clinical sample were collected examined with the LFA device being developed and validated using ELISA assay.

Application

Rapid point-of-care, easy to use, diagnostic device to detect and monitor thyroid cancer and metastases. The device can be used in the clinic when the doctor performs biopsy procedure to receive answer in the same time. Another option is using the device in the surgery room to perform rapid biopsy and to optimize the tumor removal. The point-of-care quantitative device, CFA, can be used in the clinic to monitor possible reoccurrence.

Advantages

- Novel Point-of-Care assay and device to detect and monitor thyroid cancer and metastases
- Quantitative or qualitative Point-of-care devices for the clinic site during patient' visit & during surgery
- Rapid and robust device
- Portable and user-friendly device
- Quantification in one step vs. at least 2 steps found in most immunoassays that require dedicated signal reader.
- Requires only 1 antibody vs. 2 in all lateral flow tech. enables hapten size detection and reduce 50% of immune reagent costs
- Internal-calibration concept using proprietary capture layer
- Enables any cellphone reading

Patent

WO2022/153316A1; WO2020/141525A1 (capture flow technology)