

Reference Protocol for biotinylated Anti-Nucleocapsid Cov-1/2 (HS-452 111BT) Immunohistochemistry using DAB as Chromogen

Tissue Fixation

- 3.7% formaldehyde (24 h), 3.5 μ M paraffin sections

Materials and Reagents

- Food Steamer Braun, Multigourmet
- Staining Containers with slide holders (e.g. Tissue-Tek)
- Protein Block, Serum-Free Agilent X0909
- Antibody diluent Agilent S2022
- ABC HRP Kit, Standard Vectorlabs PK-4000
- ImmPACT DAB Vectorlabs SK-4105
- Hydrogen peroxide 30% Merck 1.07298.0250
- PBS (pH 7.4)
- TBST (TBS, 0.05% Tween 20, pH 7.6)
- Antigen Retrieval buffer:
Citrate Buffer (10 mM Citrate, 0.05% Tween 20, pH 6.0)
- Xylene, 100% ethanol, 90% ethanol, 80% ethanol and 70% ethanol, 2-propanol
- Optional: Hematoxylin Solution (Mayer's, Modified) or other nuclear counterstain
- Optional: Avidin/Biotin Blocking Kit Vectorlabs SP-2001
- Non-aqueous mounting medium

Method

1) Deparaffinize and hydrate tissue sections

- a) Xylol 2 x 5 min
- b) 100% EtOH 2 x 2 min
- c) 90% EtOH 1 x 2 min
- d) 80% EtOH 1 x 2 min
- e) 70% EtOH 2 x 2 min
- f) Deionized Water 1 x 20 sec
- g) PBS 1 x 2 min

*Keep the slides in PBS until ready to perform the Antigen Retrieval.
Do not allow the slides to dry out*

2) Antigen Retrieval (AR) using a food steamer

- a) Heat the steamer with a suitable staining container filled with Antigen Retrieval buffer to **$\sim 97^{\circ}\text{C}$**
- b) Transfer the sections into the staining box, wait until the temperature reaches **97°C**
- c) Incubate the sections in the steamer for **30 min**
- d) Remove the staining container from the steamer and allow the slides to cool down for **20 min** (target end temperature **$\sim 60^{\circ}\text{C}$**)

- 3) Wash slides in PBS, 3 x 1 min
- 4) **Blocking endogenous peroxidase activity**
 - a) Incubate the sections with 3% hydrogen peroxide in PBS (freshly prepared!) for 5 min
- 5) Wash slides in PBS, 2 x 1 min
- 6) Wash slides in TBST, 1 x 2 min
- 7) **Optional: Perform Avidin-Biotin-Block according to manufacturer's instructions.**

Note: Certain tissues (e.g. liver, kidney) contain high levels of endogenous biotin. The Avidin-Biotin blocking step is recommended when using the ABC system for these tissues. If the background problem persists, consider trying a polymer-based detection system instead of biotinylated secondary antibody / ABC system.
- 8) Block in Protein Block, Serum-Free for 10 min
- 9) **Drain slides (do not rinse)**
- 10) **Apply primary antibody diluted in Antibody Diluent** and incubate in a humidified chamber for 1 h at room temperature

Suggested dilution: 1:500 in Antibody Diluent

Perform step 11 in the interim
- 11) **Prepare the ABC-reagent:** 5 ml PBS + 1 drop A + 1 drop B, incubate for 30 min
- 12) Wash slides in TBST, 3 x 2 min
- 13) **Apply the ABC reagent for 30 min at room temperature**
- 14) Wash slides in TBST, 3 x 2 min
- 15) **Apply the DAB substrate, 1-10 min**

***Observe the staining with a microscope!**
Development times may differ depending upon the level of antigen*
- 16) Stop the DAB reaction with deionized water
- 17) **Optional: Counterstain**
 - a) Follow the manufacturer's instructions for counterstaining and bluing
- 18) Wash slides in deionized water for 1 min
- 19) **Dehydrate tissue sections:**

a) 70% EtOH	2 x 10 sec
b) 80% EtOH	1 x 10 sec
c) 90% EtOH	1 x 10 sec
d) 2-Propanol	2 x 1 min
e) Xylol	3 x 2 min
- 20) **Mount slides in a suitable organic mounting medium and add coverslip**

Note: The SYSY standard protocol generates good results in the SYSY labs and may be used as a reference. However, to achieve the highest specific signal and lowest non-specific background signal, the best antigen retrieval condition, antibody concentration, incubation temperature, and incubation time must be determined individually. Please also refer to our general protocols.