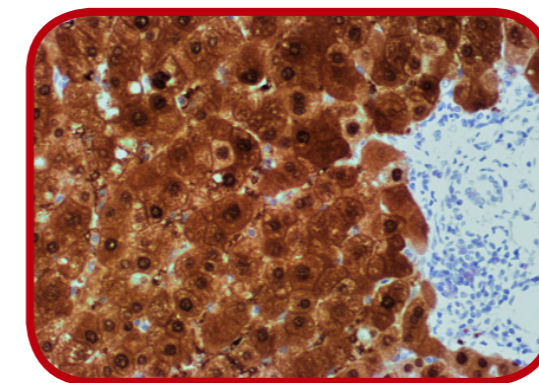


Hepatocarcinoma panel

Secondary liver carcinomas (metastasis)		
Antibody	Clone	Reference
CD117	MAD-000644QD	GIST metastasis
DOG1	MAD-000533QD	
CD45	MAD-002066QD	Majority of the lymphoid neoplasms
CDX2	MAD-000645QD	Tumors with intestinal type differentiation (including cholangiocarcinomas), gastrointestinal carcinoids
CGA	MAD-000564QD	Neuroendocrine tumors
Chromogranin A	MAD-000616QD	
Neuronal Specific Enolase	MAD-000712QD	
Synaptophysin	MAD-00685QD	
Cytoqueratin 19	MAD-002163QD	Tumors of biliary, pancreatic, or breast origin.
Cytoqueratin 7	MAD-001004QD	CK7 stains the fibrolamellar (scirrhous) variant of hepatocarcinoma
Cytoqueratin 20	MAD-005105QD	Ample spectrum of lesion among which colon, extrahepatic bile duct, lung-mucinous bronchioloalveolar, pancreatic, urothelial or Merkel cell carcinomas
GATA3	MAD-000632QD	Breast, urothelial primary among others
Inhibin	MAD-001701QD	Adrenal, sex cord stromal tumors
NapsinA	MAD-000633QD	Lung adenocarcinomas, papillary and clear cell renal cell carcinomas, ovarian clear cell carcinomas, thyroid carcinomas (follicular cell origin)
P40	MAD-000686QD	Squamous type differentiation
P63	MAD-000479QD	
PAX2	MAD-000650QD	Tumors of mullerian or mesonephric origin, medulloblastoma
PAX8		Carcinomas of mullerian, mesonephric, thyroid or thymic origin. Marker of nephrogenic adenoma
PSA	MAD-000532QD	Prostate origin
SALL4	MAD-000572QD	Pan-Germ cell tumors marker
SOX10	MAD-000656QD	Neuroectodermal origin
Thyrogloblin	MAD-000722QD	Thyroid origin
TTF1	MAD-000486QD	Lung or thyroid primaries
WT1	MAD-005671QD	Epithelial tumors of the ovary, carcinomas of the mesothelium in different locations, desmoplastic small round cell tumor, Wilm's tumor



[Clone: EP261]

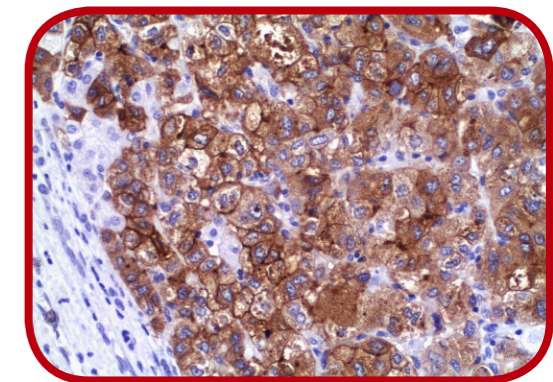
MAD-000667QD

ARG-1

- Pattern: cell cytoplasm and nuclei
- **Better sensitivity and specificity than HepPar-1 or Glypican 3 for liver hepatocarcinomas**
- As compared with HepPar-1, ARG-1 is **positive in the majority of fibrolamellar (scirrhous) variant of hepatocarcinoma**
- It is also positive in hepatoblastoma cells, particularly in the fetal component
- Does not differentiate benign from dysplastic or malignant lesions in small biopsies
- No staining in any other somatic neoplasms, not even hepatoid carcinomas of other organs

Glypican 3

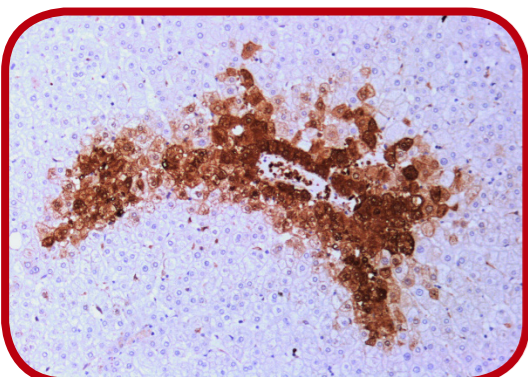
- Pattern: cell membrane and cytoplasm
- **Positive in:**
 - > up to 60% of hepatocellular carcinomas
 - > up to 50% of the high grade dysplastic nodules
 - > Fetal component of hepatoblastoma
 - > more than 70% of fibrolamellar (scirrhous) variant of hepatocarcinoma
- **Negative** in cirrhotic regenerative nodules (focal positivity can be seen)
- **Low specificity** as it can be positive in other tumors like melanomas, yolk sac tumors, ovarian clear cell carcinomas etc.



[Clone: 1G12]

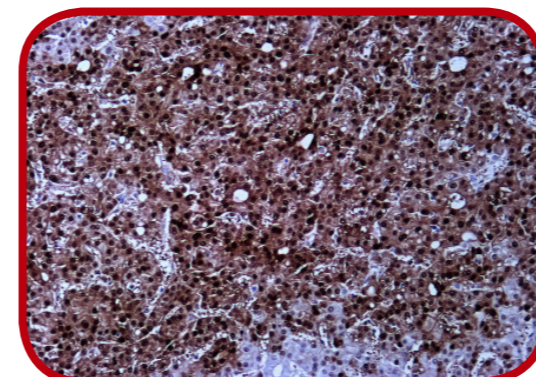
MAD-000625QD

Glutamine synthetase



[Clone: GS-6] MAD-000688QD

- Pattern: cell cytoplasm
- **Normal liver:**
 - > pericentral hepatocytes, but not in mid-zonal or periportal hepatocytes
- **Hepatocyte masses:**
 - > high expression in more than 70% of hepatocellular carcinoma
 - > low expression in dysplastic nodules
 - > In focal nodular hyperplasia it shows a map-like pattern (irregular-anastomosing)
 - > Patterns of staining in hepatocellular adenoma
 - Central vein – TCF1 gene inactivated (loss of HNF1alpha expression), Inflammatory and Unclassified type
 - Diffuse – beta-catenin activated type



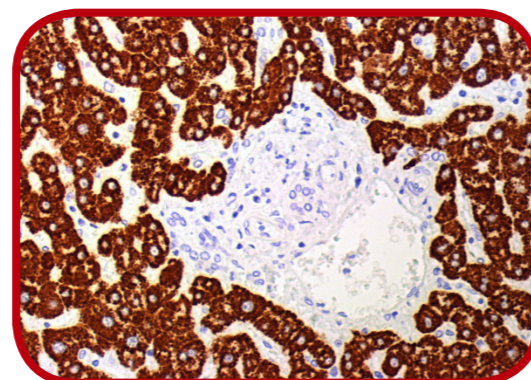
[Clone: W27] MAD-000531QD

HSP70

- Pattern: cell cytoplasm and nuclei
- **HSP70 belongs to a class of genes (heat shock proteins) implicated in tumorigenesis, regulation of cell-cycle progression and apoptosis**
- **HSP70 is a potent antiapoptotic, and its overexpression allows cells to survive in variable conditions**
- **Positive** in malignant liver neoplasm, **negative** in benign lesions
- Mayor sensitivity and specificity than Glypican 3 or Glutamine synthetase in early and well differentiated hepatocarcinomas

Hep Par 1

- Pattern: granular, cell cytoplasm
- It detects **carbamoyl-phosphate-synthetase-1 (CPS1)**, a rate-limiting enzyme in the urea cycle located in mitochondria
- **It is not 100% specific and sensitive for hepatoid differentiation**
 - > As high grade hepatocarcinomas and their fibrolamellar variant, tends to be negative
 - > It stains lung, gastric and esophageal adenocarcinomas
 - > Focal positivity has been reported
 - > In yolk sac tumors the antibody detects isolated epithelial cells of most classical and somatic glandular patterns or with hepatoid histology
 - > **positive in absorptive cells of small intestine and intestinal metaplasia**



[Clone: OCH1E5] MAD-000916QD

All hepatocarcinoma antibodies

Primary liver tumors		
Antibody	Reference	Comment
Alpha-fetoprotein	MAD-000599QD	Positive in some hepatocarcinomas and in the great majority of hepatoblastomas
CD10	MAD-002022QD	Canalicular pattern in hepatocarcinomas
CD34	MAD-001613QD	Novascular network in hepatocarcinomas as compared with reactive or benign lesions
CEA polyclonal	MAD-001115QD	Canalicular pattern in hepatocarcinomas, diffusely positive in cholangiocarcinoma
Cytoqueratin 19	MAD-002163QD	Positive in cholangiocarcinomas, negative in hepatocarcinomas
Cytoqueratin 7	MAD-001004QD	
CAM5.2	MAD-001645QD	Positive in hepatocarcinomas and negative in cholangiocarcinomas
Cytoqueratin 18	MAD-002233QD	
Cytoqueratin 8	MAD-000683QD	High ration in malignant tumors
Ki67	MAD-000310QD	
MOC31	MAD-000101QD	Positive in cholangiocarcinomas and metastatic adenocarcinomas, negative in hepatocarcinomas
PCNA	MAD-000903QD	High ration in malignant tumors
P53	MAD-000309QD	High ration in malignant tumors