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ABBILDUNGSVERZEICHNIS

Abb. 1.1: Rezeptoren zur Erkennung pathogen-assoziierter Elemente

Abb. 1.2: Das IFNβ-Enhanceosom

Abb. 1.3: Die Jak/STAT-Signalkaskaden

Abb. 1.4: Aufbau eines CMV-Partikels

Abb. 2.1: Neu synthetisierte HCMV-Proteine inhibieren nach einer transienten Induktionsphase die IFNβ-Expression

Abb. 2.2: MCMV-Infektion führt zu einer transienten Expression von IFNα/β

Abb. 2.3: MCMV-infizierte Zellen sind nicht mehr responsiv für MCMV als Stimulus der IFNβ-Expression

Abb. 2.4: MCMV-Genexpression ist notwendig für das Abschalten der IFNα/β - Expression nach MCMV-Infektion

Abb. 2.5: Neu synthetisierte MCMV-Proteine wirken als Inhibitoren der IFNβ-Induktion

Abb. 2.6: Infektion mit replikationsfähigem MCMV stimuliert alle Komponeneten des IFNβ-Enhanceosoms, während UV-behandeltes MCMV nur IRF3 aktiviert

Abb. 2.7: MCMV interferiert mit der Aktivierung von ATF-2

Abb. 2.8: MCMV inhibiert den NF-κB Signalweg

Abb. 2.9: MCMV stabilisiert IκBα

Abb. 2.10: Konstruktion neun-segmentiger Influenza A - Viren

Abb. 2.11: Expression von NS1 und NS2

Abb. 2.12: Schematische Darstellung der BAC-basierten Mutagenese des MCMV-Genoms

Abb. 2.13: Überprüfung der MCMV-Mutanten ΔM82, ΔM83 und ΔM84

Abb. 2.14: Kontrolle der gereinigten Stocks von MCMV

Abb. 2.15: *M83* und *M84* interferieren nicht mit der Aktivierung von IRF3 und NF-κB

Abb. 2.16: ΔM43 schaltet die IFNβ-Expression langsamer ab als wt-MCMV

Abb. 2.17: MCMV-Mutanten, die in IFNβ Knockout-Zellen besser replizieren als in wt-Zellen

Abb. 2.18: Überprüfung der *M43*-Deletion

Abb. 2.19: *M43*-mRNA ist *early*/*late* nachweisbar

Abb. 2.20: Im MCMV-Kontext werden zwei verschiedene Formen von M43-HA exprimiert

Abb. 2.21: ΔM43 weist nach Entfernung der Kanamycin-Kassette ein zusätzliches *m42*-Transkript auf

Abb. 2.22: Die Deletion von *M43* führt nicht zu einer generellen Störung der viralen Genexpression

Abb. 2.23: Die Deletion von *M43* beeinträchtigt die Fähigkeit zur effizienten Abschaltung der IFNβ-Produktion

Abb. 2.24: ΔM43 inhibiert nicht vollständig die IFNβ-Induktion bei Superinfektion

Abb. 2.25: ΔM43 besitzt ein Wachstumsdefizit auf IC-21 Makrophagen

Abb. 2.26: Der IFNβ-Phänotyp von ΔM43 ist in IC-21 Makrophagen verstärkt

Abb. 2.27: Die Deletion von *M43* hat keinen Einfluss auf die Inhibition der IRF3-Aktivierung

Abb. 2.28: ΔM43 zeigt keinen Defekt in der Antagonisierung der nukleären ATF-2/c-Jun Phosphorylierung

Abb. 2.29: IκBα-abhängige Aktivierung von NF-κB

Abb. 2.30: MCMV interferiert mit dem NF-κB Signalweg in *M43*-unabhängiger Weise

Abb. 2.31: ΔM43 ist nicht in der Lage, IκBα unter Bedingungen inhibierter Proteinsynthese zu stabilisieren

Abb. 2.32: Die Inhibition der Transkription induziert in ΔM43-infizierten Zellen Apoptose, die durch Caspase 3 - Aktivität nachgewiesen werden kann

Abb. 2.33: Die Halbwertszeit von IκBα ist bei intakter Proteinsynthse auch in ΔM43-infizierten Zellen verlängert

Abb. 2.34: Das IκBα-Kopräzipitationsmuster ΔM43-infizierter Zellen unterscheidet sich von dem wt-infizierter Zellen

Abb. 2.35: Die größere Form von M43-HA interagiert mit IκBα

Abb. 2.36: Die Deletion von *M43* verändert nicht die basale oder TNFα-induzierte NF-κB-Aktivität in MCMV-infizierten Zellen

Abb. 3.1: Aktivierungsprofile der im IFNβ-Enhanceosom enthaltenden Transkriptionsfaktoren

Abb. 3.2: MCMV-vermittelte Inhibition der IFNβ-induzierenden Signalwege

Abb. 3.3: Verteilung der getesteten und nicht-getesteten MCMV-ORFs

Abb. 3.4: *In silico* – Analyse der ORFs in der *M43*-Genregion

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„Die Naturwissenschaften braucht der Mensch zum Erkennen, den Glauben zum Handeln."

Max Planck

VORTRÄGE

Mouse cytomegalovirus inhibits the interferon-β induction

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PUBLIKATIONEN

Mouse cytomegalovirus inhibits interferon-β gene expression and controls activation pathways of the interferon-β enhanceosome

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ERKLÄRUNG

Hiermit erkäre ich, dass ich diese Arbeit selbständig verfasst und nur die angegebenen Hilfsmittel verwendet habe. Die Arbeit wurde bisher noch nicht anderweitig als Dissertation eingereicht oder veröffentlicht.

Düsseldorf, den 27.03.2007

Le, Vu Thuy Khanh